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KØBENHAVN
C. A. REITZEL, BOGHANDEL
Trykt hos J. Jørgensen & Co. Ivar Jantzen)
1921

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DANISH INVESTIGATIONS OF PLAICE FROM THE NORTH SEA

JULY 1919 — JULY 1920

BY

DR. KIRSTINE SMITH

KØBENHAVN
C. A. REITZEL, BOGHANDEL
TRYKT HOS J. JØRGENSEN & CO. (IVAR JANTZEN)
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I. Introduction.

It was already established, by measurements in the spring and the early summer of 1919 [1]), that the percentage of large plaice had greatly increased in the eastern part of the North Sea (area A_3) since a period of measurement which took place in 1904—1906, as well as since 1916. It was the aim of the measurements of North Sea plaice, continued during the summer until late in September of 1919 and again taken up during May and June of 1920, to investigate this change further, and at the same time to form a solid basis for comparison with future measurements.

It was considered highly probable that the change of size observed, was due to the restriction on fishing caused by the Great War, as a consequence of which, the total annual yield of the plaice fishery in the North Sea declined, when it was lowest in 1917, to about half the quantity yielded in the pre-war years.

Table 1. Showing for Various Countries the Quantity of Plaice Taken in the North Sea.

	Denmark	Germany	Holland	England [1])	Total
	Kgs.	Kgs.	Kgs.	Kgs.	millions of kgs.
1913	9.205.574	3.027.030	9.964.659	24.650.799	47
1914	6.043.535	2.489.650	9.466.933	20.508.519	38
1915	9.819.723	1.327.697	7.828.207	11.558.930	31
1916	5.777.555	2.684.285	9.541.016	11.502.085	30
1917	2.183.881	4.384.102	12.054.914	9.025.484	28
1918	2.896.931	8.412.743	11.846.954	18.925.388	42
1919	5.274 552	6.204.050	11.423.726	33.920.000	57
1920	3.887.490	—	—	46.165.000	—

[1]) From 1915 onwards all plaice landed in England and Wales are included, for 1919 those from the North Sea amount to 24.692.000 kilogs

In Table 1 is shown the quantity of plaice taken by the countries principally participating in this fishery. From Scotland, Belgium and Norway no statistics are at hand. For Scotland the yield was, in the years previous to the war, about 2 millions of kgs., and for Belgium a little more than 1 million, while for Norway the yield is as a rule below 100.000 kgs. It thus follows that, apart from the uncertainty of the origin of the plaice landed in England and Wales, the totals of Table 1 probably do not differ more than about 3 millions from the total yield of the North Sea.

[1]) Johansen and Smith: Investigations as to the effect of the restriction on fishing . . . (Medd. fra Komm. for Havunders., Serie Fiskeri, Bind V) 1919, p. 12.

By comparison with statistics for the previous years it will be seen that the quantity of plaice landed in England and Wales has increased considerably during 1919 and 1920. For 1919 the quantity of these plaice originating from the North Sea is known and appears to be equal to the yield in 1913. For 1920 we only know the total quantity landed and this has increased by 36 % from 1919.

The yield of the German plaice fishery in the North Sea did in 1918 reach a value not previously recorded being about 3 times the average annual value for the years preceding the war [1]).

The Dutch plaice fishing seems less affected by the war than those of any of the other countries. There was a small decline of the yield in 1915, and it has for 1917—1919 been somewhat above the pre-war average.

Table 2. Weight and Value of Plaice Landed in Esbjerg in 1919 from Danish Vessels, together with the Number of Fishing Crafts.

(After the Danish »Fiskeri-Beretning«.)

Month	From Cutters				From Small Boats			
	Kilogs.	Value in Kr.	Price per kg in Øre	Number of Fishing Cutters	Kilogs.	Value in Kr.	Price per kg in Øre	Number of Fishing Boats
January	94.000	46.742	50	62	22.300	11.149	50	187
February	374.600	262.101	70	187	—	—	—	—
March	1.146.332	873.247	76	284	—	—	—	—
April	929.500	590.760	63	322	—	—	—	—
May	694.930	418.575	60	325	—	—	—	—
June	329.900	288.520	87	318	—	—	—	—
July	381.050	326.640	86	298	—	—	—	—
August	359.500	336.192	94	271	—	—	—	—
September	347.100	283.490	82	263	—	—	—	—
October	135.200	117.402	87	230	20.000	10.000	50	182
November	46.430	30.800	66	210	32.000	16.000	50	197
December	22.700	15.000	66	155	4.000	2.000	50	197
Total	4.861.242 *)	3.589.469	74	—	78.300	39.149	50	—

*) Besides this 150.000 kgs were directly brought to foreign harbours.

The yield of the Danish plaice fishery in the North Sea did neither in 1919 nor in 1920 reach the pre-war quantity, a fact that must be explained by the difficult conditions of sale. The distribution of the catch in the months of the year 1919 is given i Table 2. It appears that the maximum yield occurred already in March, when it was greater than for any month of the years 1916—1918, and when the number of fishing cutters also surpassed that for any month of these years. In previous years the plaice fishery used to culminate in May or April and there is obviously a connection between the decline of yield from March to April and May in 1919 and the increasing fishing for haddock, a fishery which also takes place principally in the spring and early summer. The Danish haddock fishery was, before 1916, of small significance, but since then it has grown to be of essential importance, and is at present, in value as well as in quantity, the predominant Danish fishery in the North Sea. The following table, which for each month of the years 1913 and 1919 indicates the number of catches landed in Esbjerg of plaice and haddock respectively, illustrates the relative magnitude of the two fisheries and especially the rapid change from plaice to haddock fishery from March to April 1919.

[1]) Vide Johansen and Smith: l. c. p. 3, Table I.

Number of Catches of Plaice and of Haddock Landed in Esbjerg for each Month of the Years 1913 and 1919*).

	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Plaice 1913	8	81	216	818	735	523	419	418	423	348	61	13
Haddock 1913	35	14	—	7	12	3	3	—	—	36	15	12
Plaice 1919	6	179	352	209	169	75	69	80	77	44	11	—
Haddock 1919	8	1	6	174	354	169	145	12	12	43	42	6

*) The table gives the number of catches as found from the journals kept by the fishermen.

It follows from this that the yield of the Danish plaice fishery in the North Sea cannot be expected to indicate directly the possible variation in the size of the stock.

II. Measurements of plaice landed in Esbjerg (Jutland).

1. New material.

As it will be seen from Table 1 and 2 the plaice caught by Esbjerg cutters in 1919 amounts to 95 % of all the plaice taken by Danish vessels from the North Sea. The plaice landed in Esbjerg therefore represents very well the yield of the Danish North Sea fishery and still better the plaice taken from the neighbouring waters A_3 and B_4 situated west of Esbjerg.

The measurements of length of plaice landed in Esbjerg, which were commenced in April 1919, and which have been published for the three months April to June 1919[1]), were carried on until the end of September and again taken up during the months May and June of 1920. These new measurements recorded here have been made on the same lines and according to the same rules as those from the spring of 1919[2]). The size-limit for plaice landed in Esbjerg has, during the two periods of measurements, been 210 mm from the tip of the snout to the base of the caudal fin or about 257 mm for the total length. The small plaice is thus discarded, but the plaice landed are not sorted otherwise for sale before measurement. The measurers, who are supervised by the fishery officials, are advised to distribute the samples as far as possible evenly among the catches, so that the areas may be fairly represented by the samples according to the catches taken there. The length of the fish is given in cm, and a stated length of 27 cm indicates that the fish is between 27 and 28 cm of length.

The measurements now published are, together with those from April-June 1919, the most numerous seasonal measurements hitherto undertaken on plaice from the northern part of the areas A_3 and B_4 (see Fig.1). During April—September (incl.) 1919, more than 107.000 plaice distributed in 931 samples have been measured, and of these 76 % belong to catches from A_3. In May and June 1920 over 58.000 plaice have been measured belonging to 521 samples, of which 81 % have arisen from A_3, where the fishing is carried on during spring and early summer especially. For comparison it may be mentioned that the greatest annual number of measurements previously made of plaice from the Esbjerg areas was about 12.000 for each of the years 1905 and 1916, when the samples from A_3 were 37 and 64 % respectively of the total number. The measurements of length for 1919 enable us for the first time to form a closer idea of the distribution of the size of plaice in these waters according to position and according to season.

[1]) Johansen and Smith: l. c.
[2]) l. c. pp. 8—9.

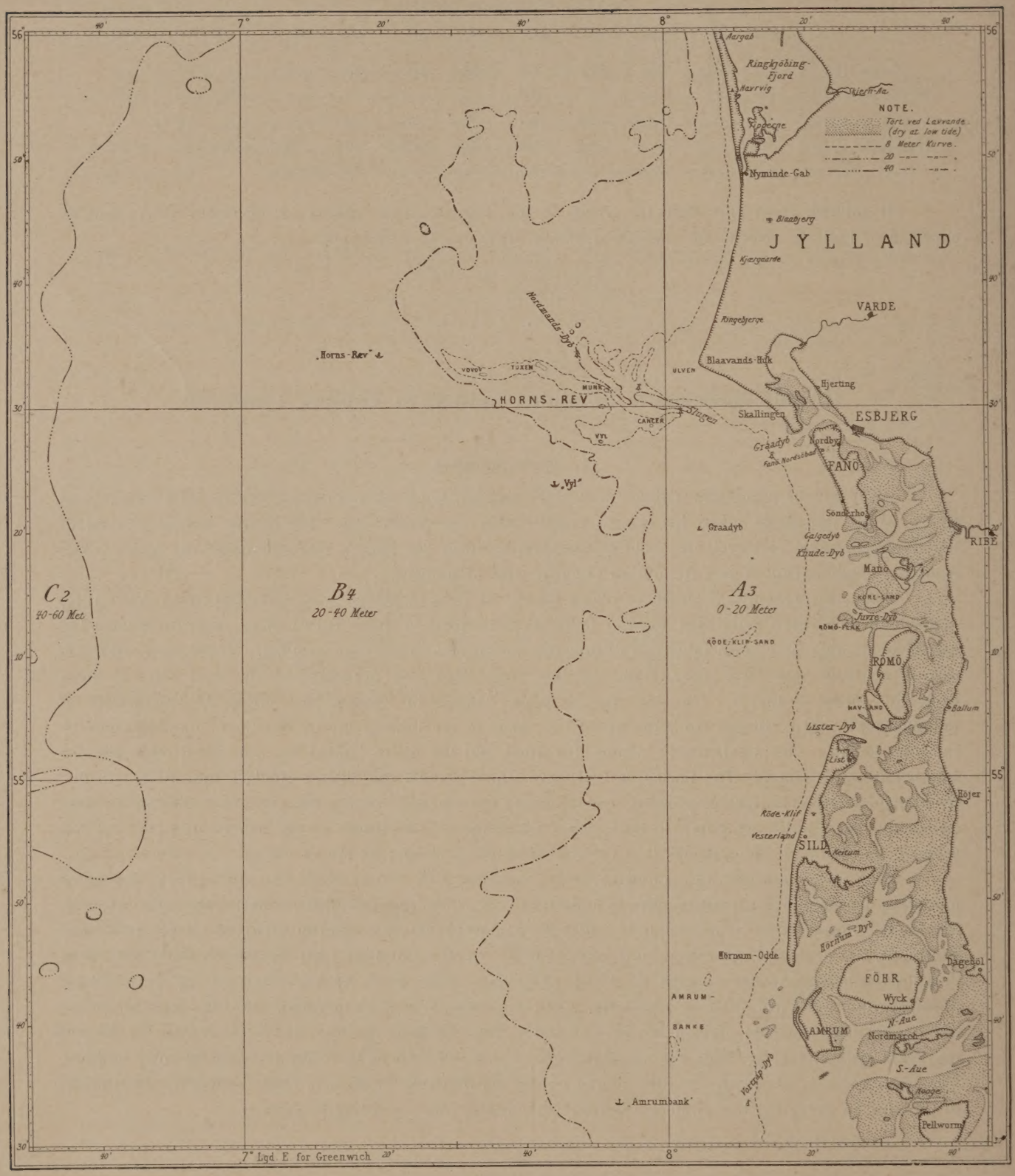

Fig. 1. The northern part of the areas A_3 and B_4 of the North Sea.

2. The fishing grounds worked in 1919 and 1920.

It was shown[1]) by the measurements in the spring of 1919 that in the area A_3 the percentage number of plaice over 33 cm of length increased greatly with increasing depth of the fishing-place. For comparison of samples collected at different seasons or in different years it was therefore found necessary to subdivide the area into $A_{3,a}$ and $A_{3,b}$ the former being shallower than 8 m. This division was all the more needed as the blocking by mines and later on the danger of floating mines had, since the beginning of the War limited the fishing area artificially. Neither in 1919 nor even in 1920 can we expect that the fishing has taken place freely, without regard to the danger of mines as in former years, and we cannot suppose therefore that samples from A_3 in these two years have arisen necessarily from the same grounds as in pre-war years or even in 1916, for which year measurements are also available.

In May 1919 it was significant that of all the samples from A_3 60 % had arisen from $A_{3,a}$, while in 1920 no samples and in former years hardly any, had occurred from those shallow grounds. How far this fishing inside the 8 meters curve was due to the mine danger, and how far it was owing to an extraordinary abundance of younger plaice belonging to the shallow grounds is not clearly demonstrated. In comparing the origin of the samples from A_3 and B_4 for May and June of the two years 1919 and 1920 it is noticed, that in 1920 the fishing has, on the whole, been carried on further to sea from Esbjerg, both in westerly and southerly directions than in the previous year. In 1919 the samples have chiefly arisen from the waters between 55° 00′ and 55° 30′ N. Lat. and these we shall name $A_3\,B_4$ n, but in 1920 as many or rather more of the samples have come from the waters south of 55° 00′ N. Lat. and north of 54° 30′ N. Lat. and these we call $A_3\,B_4$ s. From north of these two areas or south of them only a smaller number of samples are at hand. But within $A_3\,B_4$ n and $A_3\,B_4$ s the material is so ample that it is possible to follow the variation of size of plaice according to season for several depths. Sorting the samples according to the depth of the fishing-place we give in Tables 3 and 4 for subdivisions of the two areas (1) the number of plaice over 33 cm per 100 plaice over 27 cm of length and (2) in italics the number of samples, from which this percentage has been calculated. The two tables thus illustrate for the waters between 54° 30′ and 55° 30′ N. Lat. the distribution of the samples.

3. Variation of length according to season and according to position of the fishing- place.

When comparing a great number of individual samples from different localities and for different seasons it may, for the economy of work be necessary to limit the comparison to a single characteristic which, in an essential manner, gives an idea of the length within a sample. The mean value of the sample of course first suggests itself for this purpose and would certainly be used if we took the same interest in all the indications of length within a sample. But this is not the case, because the plaice are sorted and moreover sorted perhaps in a varying way according to season or to the abundance of catch. The precentage of plaice over 33 cm calculated only from plaice over 27 cm is presumably not, or scarcely not, affected by the method of sorting and has proved useful as a characteristic. The percentage of Tables 3 and 4 are mean values of percentages calculated for the single samples; it has been possible therefore to calculate their standard deviations for the areas most numerously represented. Although rather uncertain because of the small number of samples in each subarea, they give some idea of the accuracy of the values of the tables.

We find on the whole, where the observations are sufficiently numerous, that the relative number of plaice over 33 cm of length increase with the depth of the fishing-place. This is most conspicuous for A_3B_4n in May 1919, where e. g. for the second decade[2]), when going from 6.5—8.5 to 8.5—10.5 m a rise is found from 10 to 21; the difference is 11 with st. d. 4.6. In June and later in the summer the number of greater plaice seems to increase more slowly with the depth.

[1]) l. c. p. 11.

[2]) By a »decade« is indicated a period of ten days.

Table 3. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in $A_3 B_4 n$ for Decades. (Number of samples in italics).

Depth in m	under 2.5	2.5—4.5	4.5—6.5	6.5—8.5	8.5—10.5	10.5-12.5	12.5-14.5	14.5-16.5	16.5-18.5	18.5-20.5	20.5-22.5	22.5-24.5	24.5-26.5	26.5-28.5
1916														
Apr. 27.—28.	—	—	—	0	4	2	6	2	—	—	—	—	—	—
				4	*6*	*11*	7	*2*						
May 1.—10.	—	—	—	—	4	6	6	14	—	—	—	5	—	—
					1	*1*	*5*	*10*				*2*		
11.—20.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24.—25.	—	—	—	—	—	—	14	16	—	4	—	—	—	—
							5	*3*		*1*				
June 1.—10.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11.—20.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28.—29.	—	—	—	—	—	—	8	14	24	12	9	—	—	—
							1	*1*	*1*	*5*	*4*			
1919														
Apr. 14.—19.	—	—	4	—	—	4	—	—	—	—	—	—	—	—
			1			*1*								
22.—30.	—	—	10	9	8	16	—	—	—	—	—	—	—	—
			5	*7*	*2*	*1*								
May 2.—10.	—	8	7	8+2	15	19	—	—	—	—	—	—	—	—
		9	*11*	*18*	*4*	*4*								
11.—20.	3	6	7	10+2	21+4	28	—	39	22	—	—	—	—	—
	2	*9*	*7*	*19*	*17*	*5*		*1*	*1*					
21. 31.	3	1	6	7+2	9+2	14	35	29	—	—	—	—	—	—
	3	*1*	*8*	*12*	*13*	*11*	*3*	*4*						
June 1.—10.	—	—	—	3	8	14	12+4	7	12	18	—	—	—	—
				2	*2*	*7*	*13*	*3*	*5*	*1*				
11.—20.	—	—	—	11	—	10	10+3	16	18	29	12	4	—	—
				1		*5*	*13*	*14*	*12*	*3*	*1*	*1*		
21.—30.	—	—	—	—	—	—	—	46	18	21	—	—	10	—
								1	*7*	*10*			*1*	
July 1.—10.	—	—	—	—	—	—	18	17	21	20	16	11	—	—
							1	*3*	*12*	*17*	*8*	*3*		
11.—20.	—	—	—	—	—	—	—	—	4	—	21	17	—	—
									1		*4*	*1*		
21.—31.	—	—	—	—	—	—	10	9	9	3	—	18	—	—
							10	*6*	*11*	*4*		*1*		
Aug. 1.—10.	—	—	—	—	—	—	31	13	13	13	23	8	—	7
							1	*7*	*6*	*4*	*3*	*1*		*1*
11.—20.	—	—	—	—	—	6	7	10	11	11	15	12	—	—
						2	*6*	*15*	*21*	*19*	*8*	*4*		
21.—31.	—	—	—	—	—	4	—	—	18	19	10	—	9	—
						1			*6*	*7*	*3*		*1*	
Sept. 1.—10.	—	—	13	—	—	—	6	17	20	16	22	10	15	13
			1				*3*	*14*	22	*17*	*4*	*1*	*1*	*1*
11.—20.	—	—	—	—	—	—	4	17	16	13	11	3	11	—
							3	*12*	*12*	*4*	2	*2*	*1*	
21.—30.	—	—	—	—	—	9	—	3	0	—	—	—	—	—
						1		*2*	*1*					
1920														
May 2.—10.	—	—	—	—	—	—	—	—	43	—	—	—	—	—
									2					
11.—20.	—	—	—	—	—	0	22	23	16	39	—	—	—	—
						1	*8*	*3*	*1*	*1*				
21.—31.	—	—	—	—	—	—	26+4	33+6	29	16	—	—	—	—
							16	*16*	2	*1*				
June 1.—10.	—	—	—	—	2	1	10+3	14+4	20	23	—	—	—	—
					2	4	*14*	*13*	*11*	*4*				
11.—20.	—	—	—	—	—	—	7	15	23	24	—	—	—	—
							6	*12*	*7*	*6*				
21.—30.	—	—	—	—	—	—	11	7	13	9	5	—	—	—
							1	*3*	*2*	*5*	*1*			

Looking next at the variation according to season we find in A_3B_4n for depth from 7 to 12 m a maximum in the second decade of May 1919. Few samples from greater depths are at hand for May 1919. For May 1920 the figures indicate a maximum percentage in the last decade of May for depths from 13 to 18 m. The difference between the values for May 21.—31. and for June 1.—10. is, for 12.5—14.5, equal to 16 ± 5, and for 14.5—16.5, equal to 20 ± 7. From $A_3 B_4$ s the samples are in 1919 rather scattered and a corresponding maximum value is only suggested by the figures, but in 1920 there appears to be a maximum percentage in the last decade of May for the depth 13—20 m. The maxima are not so marked that their deviations from the adjacent values can be proved in the single cases, but when for four of the subareas the values for May 21.—31. are greater than those for the previous and next following decade there is a great probability for the reality of a maximum. Supposing for each depth

Table 4. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in $A_3 B_4$ s for Decades. (Number of samples in italics).

Depth in m	6.5 – 8.5	8.5 - 10.5	10.5-12.5	12.5-14.5	14.5-16.5	16.5-18.5	18.5-20.5	20.5-22.5	22.5-24.5	24.5-26.5	26.5-28.5
1919											
Apr. 14.—19. . . .	—	4	8	—	2	—	—	—	—	—	—
		6	*2*		*1*						
22.—30. . . .	—	11	—	—	—	—	—	—	—	—	—
		6									
May 2.—10. . . .	16	7	20	28	—	—	—	—	—	—	—
	4	*3*	*1*	*1*							
11.—20. . . .	7	—	34	3	—	—	—	—	—	—	
	3		*3*	*1*							
21.—31. . . .	—	—	49	20	52	—	—	—	—	—	
			2	*1*	*1*						
June 1.—10. . . .	—	—	9	6	55	—	0	58	—	—	—
			1	*2*	*1*		*1*	*1*			
11.—20. . . .	—	—	33	4	18	29	41	6	—	23	—
			1	*1*	*4*	*3*	*1*	*1*		*1*	
21.—30. . . .	—	—	—	—	—	—	—	—	—	—	—
July 1.—10. . . .	—	—	—	—	33	36	21	32	—	—	—
					2	*5*	*9*	*4*			
11.—20. . . .	—	—	—	—	—	20	17	18	37	—	—
						7	*20*	*12*	*3*		
21.—31. . . .	—	—	—	—	35	28	14	13	16	—	—
					1	*1*	*1*	*8*	7		
Aug. 1.—10. . . .	—	—	—	—	9	—	—	19	3	—	—
					1			*1*	*1*		
11.—20. . . .	—	—	—	—	4	—	7	16	15	3	—
					1		*3*	*4*	*4*	*1*	
21.—31. . . .	—	—	—	—	—	—	—	—	—	—	
Sept. 1.—10. . . .	—	—	—	18	25	21	25	—	1	16	-
				1	*11*	7	*5*		*3*	*1*	
11.—20. . . .	—	24	—	—	18	26	37	22	—	—	—
		1			*5*	*6*	*3*	*1*			
21.—30. . . .	—	—	—	—	—	—	—	—	—	—	—
1920											
May 2.—10. . . .	—	15	5	12+2	19+2	21	30	—	—	—	—
		1	*2*	*22*	*15*	*6*	*4*				
11.—20. . . .	—	5	10	14+1	16+2	24	30	29	—	—	—
		2	7	*33*	*42*	7	*4*	*3*			
21.—31. . . .	—	—	15	17+2	18+3	34	59	—	99	—	—
			1	*21*	*14*	*4*	*5*		*1*		
June 1.—10. . . .	—	—	—	14	16	19	21	25	39	—	—
				7	*11*	*11*	*9*	*4*	*4*		
11.—20. . . .	—	—	—	—	9	11	14	49	91	69	68
					3	*4*	*2*	?	*1*	*3*	*2*
21.—30. . . .	—	—	—	—	6	7	16	—	39	60	—
					3	*5*	*4*		*4*	*5*	

the values were really constant during the three decades, then the probability that by chance the mean of the observations for the middle decade in all of the four cases would be the greatest is $(\frac{1}{3})^4 = \frac{1}{81}$.

We have thus for area A_3B_4n and A_3B_4s in 1920 found that there is a maximum number of larger plaice at the depths 13—18 m in May 21.—31., and in 1919 we have for the depths 7—12 m in A_3B_4n found a maximum percentage of plaice over 33 cm in the second decade of May. Neither of these conclusions are contradicted by the figures for the other year, but are for this year supported by figures arising only from a few samples, so that it cannot be stated that the percentages have varied exactly according to the same rules in the spring of both years.

In 1920, when the samples are numerous in A_3B_4s as well as in A_3B_4n, we find that the maximum percentage is much less pronounced in the southern than in the northern area. Comparing the values for 12.5—14.5 m we find the difference between the maximum values to be 9 ± 4.7, and for 14.5—16.5 m it is 16 ± 3. On the whole the material from 1920 seems to show that the plaice is smaller in A_3B_4s than at the same depths in A_3B_4n, but the deviations between the percentages are nowhere else so pronounced as for the third decade of May, when the maximum values occur.

For the further study of the seasonal variation in 1919 of the percentage of plaice over 33 cm, the monthly mean values are to be preferred for mean values for decades. Those are given in Tables 5 and 6.

On the whole the percentages for a given depth are seen, from these tables, to decrease during June, July and August. For September the figures however seem to increase again. For A_3B_4n we find,

Table 5. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in Area A_3B_4n for Various Months of 1919. (Number of samples in italics).

Depth in m	under 2.5	2.5—4.5	4.5—6.5	6.5—8.5	8.5—10.5	10.5-12.5	12.5-14.5	14.5-16.5	16.5-18.5	18.5-20.5	20.5-22.5	22.5-24.5	24.5-26.5	26.5-28.5
April	—	—	9	9	8	10	—	—	—	—	—	—	—	—
			6	*7*	*2*	*2*								
May	3	7	7	8	15	18	35	31	22	—	—	—	—	—
	5	*19*	*26*	*49*	*34*	*20*	*3*	*5*	*1*					
June	—	—	—	6	8	13	11	16	17	23	12	4	—	10
				3	*2*	*12*	*26*	*18*	*24*	*14*	*1*	*1*		*1*
July	—	—	—	—	—	—	11	12	15+2	17	18	14	—	—
							11	*9*	*24*	*21*	*12*	5		
Aug.	—	—	—	—	—	5	10	11+2	13+1	13	16	11	9	7
						3	*7*	*22*	*33*	*30*	*14*	*5*	*1*	*1*
Sept.	—	—	13	—	—	9	5	16+2	18+2	16	18	6	13	13
			1			*1*	*6*	*28*	*35*	*21*	*6*	*3*	*2*	*1*

Table 6. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in Area A_3B_4s for Various Months of 1919. (Number of samples in italics).

Depth in m	6.5—8.5	8.5—10.5	10.5-12.5	12.5-14.5	14.5-16.5	16.5-18.5	18.5-20.5	20.5-22.5	22.5-24.5	24.5-26.5
April	—	7	8		2	—	—	—	—	—
		12	*2*		*1*					
May	13	7	35	17	52	—	—	—	—	—
	7	*3*	*6*	*3*	*1*					
June	—	—	21	5	25	29	21	32	—	23
			2	*3*	*5*	*3*	2	*2*		*1*
July	—	—	—	—	34	27+4	18+2	19	23	—
					3	*13*	*30*	*24*	*10*	
Aug.	—	—	—	—	7	—	7	17	13	3
					2		*3*	*5*	*5*	*1*
Sept.	—	24	—	18	23+2	23+4	29	22	1	16
		1		*1*	*16*	*13*	*8*	*1*	*3*	*1*

for the depth 14.5—16.5 m, the deviation 5.3 ± 2.9 between the values for September and August, while for the depths 16.5—18.5 the corresponding deviation is 5.3 ± 2.2. Neither of these results taken alone would conclusively show an increase, but together, and supported by the deviations found for the depth 19—22, they leave small doubt that the relative number of plaice over 33 cm in 1919 have increased from August to September in this part of $A_3 B_4$ n. From $A_3 B_4$ s very few samples are taken in August. But for each of the subareas under 23 m of depth where samples occur in August, we find that the August values are below those for July and September. Comparing the two areas $A_3 B_4$ n and $A_3 B_4$ s we find the latter in July and September to be characterised by the greater figures. For July only a single difference namely that for the depth 16.5—18.5, which is 11.6 ± 4.5, can be proved to signify. The significance is weakened however by the fact that percentages for greater depths in $A_3 B_4$ s are smaller than for 16.5—18.5 m, so that there is a probability that the value for this subarea suffers from an error which makes it too great. For September, all the values for the depths 13—22 m in $A_3 B_4$ s are greater than the corresponding values for $A_3 B_4$ n. The most significant difference is that for 14.5 — 16.5, which is 6.7 ± 3.2. Together with the other deviations in the same direction, it makes it very probable that there was in September a greater percentage of plaice over 33 cm in $A_3 B_4$ s than in $A_3 B_4$ n.

We have thus seen from Tables 3—6 that the percentage of plaice over 33 cm at a given time is primarily dependent on the depth of the fishing-place. We have further derived from the tables the fact that having regard to a constant depth of the part of the areas most intensely fished, the percentage of plaice over 33 cm of length both in the northern and southern area, has a maximum value in the later part or the middle of May, and that it probably continues to decrease until it reaches a minimum value in August after which an increase is observed which is possibly more pronounced in the southern than in the northern area. The spring maximum observed in May 1920 is on the contrary greater in the northern than in the southern area.

Table 7. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in Subdivisions of A_3 and B_4. Aug. 1919. (Number of samples in italics).

Depth in m	10.5—12.5	12.5—14.5	14.5—16.5	16.5—18.5	18.5—20.5	20.5—22.5	22.5—24.5	24.5—26.5	26.5—27.5
$A_3 B_4$ nn.	—	8	4	11	9	15	10	—	—
		1	*1*	*2*	*8*	*10*	*17*		
$A_3 B_4$ n	5	10	11±2	13±1	13	16	11	9	7
	3	*7*	*22*	*33*	*30*	*14*	*5*	*1*	*1*
$A_3 B_4$ s	—	—	7	—	7	17	13	3	—
			2		*3*	*5*	*5*	*1*	
Sept. 1919.									
$A_3 B_4$ nn.	—	2	11	26	16	16	13	—	—
		1	*2*	*2*	*8*	*10*	*7*		
$A_3 B_4$ n	—	5	16±2	18±2	16	18	6	13	—
		6	*28*	*35*	*21*	*6*	*3*	*2*	
$A_3 B_4$ s	—	18	23±2	23±4	29	22	1	16	—
		1	*16*	*13*	*8*	*1*	*3*	*1*	

For August and September a number, which is not insignificant, of samples is at hand from the part of $A_3 B_4$ north of 55° 30 N. Lat., which we shall name $A_3 B_4$ nn. In Table 7 are shown the percentages of plaice over 33 cm for this area, together with those for the two southern areas. It will be seen from the table that also for $A_3 B_4$ nn the figures for September are greater than for August, and that there is on the whole an increase to be found in the southerly direction.

Table 8. Number of Plaice over 33 cm per 100 Plaice over 27 cm of Length in Subdivisions of A_3 and B_4. May 1920. (Number of samples in italics).

Depth in m	8.5-10.5	10.5-12.5	12.5-14.5	14.5-16.5	16.5-18.5	18.5-20.5	20.5-22.5	22.5-24.5	24.5-26.5	26.5-28.5	28.5-30.5	30.5-32.5
A_3B_4nn .	—	—	21	36	26	31	—	—	—	—	—	—
			2	*2*	*6*	5						
A_3B_4n. .	—	0	25	32	32	28	—	—	—	—	—	—
		1	*24*	*19*	*5*	*2*						
A_3B_4s . .	8	10	14	17	25	40	29	99	—	—	—	—
	3	*10*	*76*	*71*	*17*	*14*	*3*	*1*				
A_3B_4ss .	—	—	—	8	44	64	85	75	—	—	—	—
				1	*1*	7	*2*	5				
June 1920.												
A_3B_4nn .	—	0	—	0	2	3	—	2	—	—	—	—
		1		*1*	*2*	2		*1*				
A_3B_4n. .	2	1	9	14	20	19	5	—	—	—	—	—
	2	*4*	*21*	*28*	*20*	*15*	*1*					
A_3B_4s . .	—	—	14	13	14	19	33	47	63	68	—	—
			7	*17*	*20*	*15*	*6*	*9*	*8*	*2*		
A_3B_4ss .	—	—	—	—	—	31	39	48	48	74	85	64
						2	*8*	*10*	*23*	*12*	*2*	*3*

For May and June 1920 samples are available from A_3B_4nn as well as from the part of A_3 and B_4 situated south of 54°30 N. Lat., which shall be named A_3B_4ss. Table 8 shows that again for these two areas, the percentages of plaice over 33 cm are smaller in June than for the same depth in May. It is further noticed that for each month and for the same depth the figures are as a rule greatest in the southernmost area.

It follows from this, that for comparison of the length of plaice in different years a division of A_3 and B_4 by half degrees of latitude may be useful especially for the months May and September, but that a consideration of the depth inside these areas is of essential importance. The depth of the fishing-place is presumably as a rule more accurately stated than the geographical position, and it is by calculating mean depth possible to pay attention to some extent to the depth without dividing the areas A_3 and B_4. The mean depths always ought to be stated when different groups of samples from these waters are compared; if the mean values agree it is a control that the groups are directly comparable. If they differ we get an indication of what sort of a difference we may expect in the length because of the different depth, and it may in some cases still be possible to draw conclusions from the comparison. In other cases, when e. g. we find that of two groups of samples the one with the greater average depth has the larger fish, knowledge of the mean depth is not sufficient, and it may be necessary to subdivide the area.

4 Frequencies of length from area A_3; comparison with previous years.

By means of the previous investigations we are to some extent prepared to judge, whether two groups of samples from partly different grounds can be expected at a given time to differ in length or not. In other words we may form some idea of whether a difference found is due to difference in place or difference in time. We shall now consider the frequency distribution of the samples.

Table 9 contains, for the new measurements the frequencies per 1000 of plaice calculated from the total number of samples from area A_3. The results for May and June have already been compared[1]) with measurements from 1905—1907 and 1916. For the later summer we have only for comparison some measurements for September undertaken in 1904—1905 and 1916.

[1]) l. c. p. 10.

Tabel 9. Frequency of Length per 1000 of Plaice and Difference between Frequencies for the same Month in Different Years in Area A_3.

Month	May			June			July	Aug.	September						Month
Year	1919	1920	1919 & 1920	1919	1920	1919 & 1920	1919	1919	1904—1905	1916	1919	1904—1905 & 1916	1916 & 1919	1904—1905 & 1919	Year
	Freq. from 206 sampl. from aver. depth 8 m	Freq. from 265 sampl. from aver. depth 15 m	Diff. of Freq.	Freq. from 110 sampl. from aver. depth 15 m	Freq. from 152 sampl. from aver. depth 16 m	Diff. of Freq.	Freq. from 116 sampl. from aver. depth 17 m	Freq. from 103 sampl. from aver. depth 17 m	Freq. from 8 sampl. from aver. depth 16,5 m	Freq. from 8 sampl. from aver. depth 15 m	Freq. from 136 sampl. from aver. depth 16,5 m	Diff. of Freq.	Diff. of Freq.	Diff. of Freq.	
Length cm															Length cm
22	0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	22
23	9	3	+ 6	12	1	+12	8	13	4	—	16	+ 4	— 16	— 12	23
24	31	17	+14	46	13	+33	40	52	34	—	55	+ 34	— 55	— 22	24
25	71	54	+17	100	61	+39	100	110	157	343	108	—186	+235	+ 49	25
26	122	103	+19	137	141	— 4	154	147	245	324	130	— 79	+194	+115	26
27	151	131	+20	159	188	—29	177	156	207	172	137	+ 35	+ 35	+ 70	27
28	150	129	+19	132	151	—19	134	143	148	76	120	+ 72	- 44	+ 28	28
29	122	121	+ 1	109	126	—17	99	113	86	53	99	+ 33	— 46	— 13	29
30	102	101	+ 1	81	85	— 4	75	84	64	13	85	+ 52	— 72	— 21	30
31	74	91	—17	56	66	—10	55	59	21	5	65	+ 16	— 60	— 43	31
32	52	66	—14	50	50	0	39	43	15	3	49	+ 12	— 46	— 34	32
33	37	54	—17	34	35	0	30	29	6	2	34	+ 4	— 33	— 28	33
34	27	42	—15	28	27	0	26	18	5	2	29	+ 3	— 27	— 24	34
35	19	27	— 8	20	17	+ 3	19	12	2	2	19	+ 1	— 18	— 17	35
36	11	18	— 6	13	12	+ 2	15	8	2	0	15	+ 2	— 15	— 13	36
37	9	14	— 5	8	8	— 1	11	5	2	2	11	+ 1	— 9	— 9	37
38	5	9	— 5	6	6	0	7	4	0	2	9	— 2	— 7	9	38
39	4	6	— 2	4	4	0	4	3	0	2	7	— 2	— 6	— 7	39
40	2	6	— 3	2	5	— 3	4	1	1	—	5	+ 1	— 5	— 4	40
41	1	4	— 3	1	2	0	2	0.8	—	—	3	—	— 3	— 3	41
42	1	3	— 2	0.4	0.6	—	1	0.6	—	—	2	—	— 2	— 2	42
43	0.0	1.6	— 2	0.2	1.0	—	0.5	0.3	—	—	1	—	— 1	— 1	43
44	0.0	0.4	—	0.1	0.4	—	0.2	0.1	—	—	0.4	—	—	—	44
45	0.0	0.6	—	—	0.06	—	0.2	0.0	—	—	0.5	—	—	—	45
46	0.0	0.1	—	—	0.06	—	0.0	0.0	—	—	0.1	—	—	—	46
47	0.0	0.0	—	—	0.06	—	0.1	0.1	—	—	0.2	—	—	—	47
48	0.0	0.0	—	—	0.00	—	0.3	—	—	—	0.0	—	—	—	48
49	0.1	0.03	—	—	0.06	—	0.1	—	—	—	0.1	—	—	—	49
50	0.0	—	—	—	—	—	—	—	—	—	—	—	—	—	50
51	0.3	—	—	—	—	—	—	—	—	—	—	—	—	—	51
under 27	233	177	+56	295	216	+80	301	321	440	667	309	—228	+358	+130	under 27
over 30	343	442	—99	305	319	—14	289	267	120	31	335	+ 88	—303	—215	over 30
Average Length [1]	28.77	29.60	—	28.47	28.83	—	28.47	28.13	27.15	26.34	28.67	—	—	—	Average Length

[1]) To get the real average 0.5 cm has to be added.

The relative decrease of plaice under 27 cm found previously for April, May and June, when comparing the earlier measurements with those from 1919, is also noticed for September, and the same decrease is observed for May and June from 1919 to 1920. But as the fishing, at any rate for May, has taken place at much greater depth in 1920 than in 1919, this is perhaps of no significance. The percentage of plaice under 27 cm in September 1916 is rather striking; it is however found that three of the 8 samples have come from $A_{3,a}$, and then the high prices for plaice in the autumn 1916 may have caused an unusual sorting, by which all those above the size limit were retained for sale.

For each month we find, when September 1916 is excepted, an increase of the percentage over 30 cm from one year to a later. For June the difference from 1919 to 1920 is however insignificant, and for May the average depth of the fishing-places was only 8 m in 1919 against 15 m in 1920, so that this makes the comparison of no consequence.

To obtain a better basis we exclude the samples from $A_{3,a}$, calculate the frequencies per 1000 of plaice over 27 cm for each sample, and afterwards calculate the means of these frequencies and the standard deviations of the means. The results are found in Table 10. Whenever possible the number of samples belonging to each of the subareas $A_{3,b}$nn, $A_{3,b}$n, $A_{3,b}$s and $A_{3,b}$ss is indicated at the foot of the table.

Table 10. Frequency of Length per 1000 of Plaice over 27 cm and Differences between Frequencies for Different Years with their Standard Deviations. Area $A_{3,b}$.

Month	May			June			July	August	September						Month
Year	1919	1920	1919 & 1920	1919	1920	1919 & 1920	1919	1919	1904-1905	1916	1919	1904—1905 & 1916	1916 & 1919	1904—1905 & 1919	Year
Length cm	Freq. from 83 sampl. from aver. depth 11 m	Freq. from 265 sampl. from aver. depth 15 m	Diff. of Freq.	Freq. from 107 sampl. from aver. depth 15 m	Freq. from 152 sampl. from aver. depth 16 m	Diff. of Freq.	Freq. from 116 sampl. from aver. depth 17 m	Freq. from 103 sampl. from aver. depth 17 m	Freq. [1]) from 8 sampl. from aver. depth 16.5 m	Freq. [1]) from 5 sampl. from aver. depth abt. 18 m	Freq. from 136 sampl. from aver. depth 16.5 m	Diff. of Freq.	Diff. of Freq.	Diff. of Freq.	Length cm
27	161±13	164± 6	— 3±14	238±12	255±11	—16±16	265±10	239±10	371 (±41)	639 (±52)	215±10	—268 (±66)	+423 (±53)	+156 (±42)	27
28	163±10	159± 4	+ 4±11	191± 7	196± 6	— 6± 9	195± 6	214± 6	263 (±22)	155 (±28)	178± 5	+109 (±36)	— 24 (±29)	+ 85 (±23)	28
29	137± 7	148± 4	—12± 8	154± 5	160± 4	— 6± 7	141± 4	165± 5	156 (±19)	93 (±23)	144± 5	+ 63 (±30)	— 51 (±24)	+ 12 (±19)	29
30	125± 6	123± 3	+ 2± 7	112± 4	106± 3	+ 6± 5	105± 4	121± 4	110 (±17)	31 (±21)	119± 4	+ 79 (±27)	— 88 (±22)	— 9 (±17)	30
31	103± 6	109± 3	— 6± 7	76± 4	81± 3	— 5± 5	77± 3	85± 4	38 (±14)	35 (±17)	90± 3	+ 4 (±22)	— 55 (±18)	— 51 (±14)	31
32	79± 5	80± 3	— 2± 5	68± 4	60± 3	+ 8± 5	54± 3	61± 3	26 (±14)	13 (±18)	67± 3	+ 12 (±23)	— 54 (±18)	— 42 (±14)	32
33	61	64	— 3	47	42	+ 5	41	41	11	8	47	+ 2	— 38	— 36	33
34	52	50	+ 2	38	33	+ 5	35	25	9	8	40	0	— 31	— 30	34
35	41	31	+10	27	20	+ 7	27	16	5	0	26	+ 5	— 26	— 21	35
36	25	20	+ 5	18	14	+ 4	19	11	4	0	21	+ 4	— 21	— 16	36
37	21	16	+ 5	10	10	0	13	7	5	0	14	+ 5	— 14	— 9	37
38	12	11	+ 1	7	7	0	10	6	0	13	12	— 13	+ 1	— 12	38
39	10	7	+ 3	5	5	0	5	3	0	6	9	— 6	— 4	— 9	39
40	7	6	0	3	5	— 3	5	2	2	—	6	+ 2	— 6	— 4	40
41	1	4	— 3	2	2	0	2	1	—	—	4	—	— 4	— 4	41
42	1	3	— 1	1	1	0	1	1	—	—	2	—	— 2	— 2	42
43	0	2	— 2	—	1	— 1	1	—	—	—	1	—	— 1	— 1	43
44	0	1	— 1	—	—	—	—	—	—	—	0.5	—	— 1	— 1	44
45	0	1	— 1	—	—	—	—	—	—	—	0.6	—	— 1	— 1	45
46	0	—	0	—	—	—	—	—	—	—	0.1	—	—	—	46
47	0	—	0	—	—	—	—	—	—	—	0.3	—	—	—	47
48	0	—	0	—	—	—	—	—	—	—	0.0	—	—	—	48
49	0	—	0	—	—	—	—	—	—	—	0.1	—	—	—	49
50	0	—	0	—	—	—	—	—	—	—	—	—	—	—	50
51	1	—	1	—	—	—	—	—	—	—	—	—	—	—	51
over 33	233±24	216±11	18±27	159±14	141±10	18±18	163±11	116± 9	36 (±41)	35 (±52)	186±10	1 (±66)	—151 (±53)	—150 (±42)	over 33
	Numb. of samples	Numb. of samples		Numb. of samples	Numb. of samples		Numb. of sampl.	Numb. of sampl.	Number of samples	Number of samples	Numb. of samples				
$A_{3,b}$nn .	5	14	—	—	6	—	13	10	—	3	10	—	—	—	
» n . .	61	51	—	93	88	—	63	88	—	2	87	—	—	—	
» s. . .	14	191	—	14	56	—	40	5	—	—	39	—	—	—	
» ss . .	—	9	—	—	2	—	—	—	—	—	—	—	—	—	

[1]) st. d. calculated by means of the samples from 1919.

Between the samples of May 1919 and May 1920 no difference in length can be pointed out, only for one length 29 cm does the difference of frequencies exceed its standard deviation. Now there is an essential difference with regard to the origin of the samples. In 1919 most of them came from $A_{3,b}$n from average depth 11 m, while in 1920 the majority of the samples are from $A_{3,b}$s from average depth 15 m. It was seen from Tables 3 and 4 that for May and June 1920 the percentage of plaice over 33 cm was, for depths from 13—16 more numerous in the northern than in the southern area. If, therefore, a greater part of the samples in May 1920 had been from $A_{3,b}$n we should have found a greater percentage of

large plaice for the average depth 15 m. We may therefore take the results in Table 10 as an indication of equal size in May 1919 and 1920.

Nor is there for June any difference in length from 1919 to 1920. There is a small difference in the average depth, the effect of which one may expect to be counterbalanced by a different percentage of samples from $A_{3,b}$s.

From July and August no suitable measurements from earlier years are available for comparison. For September only a small number of samples from 1904—1905 and 1916 are available. The five samples from 1916 are all of them from $A_{3,b}$nn and $A_{3,b}\tilde{n}$ from which it might be expected that they would, on the whole, be smaller than the samples from 1919, but the difference both for 27 cm and for over 33 is so great that it is far from being explained in that way.

It appears from these results, that the great increase of relative frequency of larger plaice in $A_{3,b}$, found[1]) by comparing the measurements from April—June 1919 with previous measurements from 1904—1906 and 1916, has been fully confirmed by the new material of measurements now examined. This increase is shown very decidedly in the relative frequency of plaice over 33 cm in A_3 which for the total amount of measurements in 1919 is 156 per 1000 of plaice over 27 cm. For the seasons 1904, 1905 and 1906 this frequency is only 33, 37 and 42 respectively and for 1916 it is 78.

5. Seasonal variations of length in $A_{3,b}$ and their probable explanations.

The values for 1919 in Table 10 and the corresponding table for April 1919[2]) show in greater detail the seasonal variations already indicated by Tables 5 and 6. We have not, for that table, the advantage of being able to compare samples from the same locality and depth, but on the other hand we may assume that the samples have arisen from the grounds most fished, which will, on the whole, be those on which the fish is at each season most abundant. With such a large store of material as that from 1919 we seem justified therefore in assuming that the samples represent fairly well the stock of plaice in $A_{3,b}$, except for those sizes with are affected by the sorting. Starting from this assumption we shall try to explain the seasonal variations of the length of plaice in $A_{3,b}$.

The composition of the stock of plaice inside a certain area can, in the course of time, alter in respect to length from the following causes: (1) migration, (2) capture, (3) growth, and (4) death from other causes than capture.

Let us suppose that the distribution of the stock for 27 cm of length upwards is in accordance with the distribution of our samples, and consider what will happen to it if no migrations took place. Let us, moreover, leave out of account for a moment the second and the fourth factor and consider the distribution of length after some interval of time. The rate of growth for plaice between 26 and 32 cm of length can be supposed to be constant, since these fish are all as a rule immature[3]). Let the percentage of plaice of the length n per 100 plaice over 27 cm be a_n in the stock before the growth period considered, and let the percentage over 32 cm be $\sum_{n=32}^{\infty} a_n$. When the plaice between 26 and 32 have grown to be 1 cm longer the percentage of plaice over 33 cm will accordingly be

$$\frac{100}{100 + a_{26}} \sum_{32}^{\infty} a_n. \qquad (I)$$

The second factor of this expression is directly known from the samples, but we shall have to examine whether the percentage of plaice of the length 26 cm (a'_{26}) observed in our samples can be considered an adequate approximation to the percentage occurring in the stock.

[1]) Vide l. c. pp. 13—14.
[2]) l. c. p. 13.
[3]) l. c. p. 23 tables.

Table 11. Number of Plaice of the Length 26 cm, a'_{26}, per 100 Plaice over 27 cm. A_3.

	April	May	June	July	August
Danish Measurements 1919	18.8	15.9	19.5	22.0	21.4
Danish Measurements 1905 . . .	—	34.6	42.2	—	—
Danish Measurements 1906 . . .	45.0	33.8	51.1	—	—
English Measurements 1905--1907	24.1	29.8	30.0	30.7	30.0

In Table 11 values of a'_{26} are given as found from the Danish measurements from A_3 in 1919, and for comparison those deduced from English market measurements from A_3 in 1905—1907 [1]), as well as those found from Danish measurements for the years 1905 and 1906. The Danish landings were all subjected to the same size limit 25.6 cm, while in the English catches, plaice of the length 26 cm are certainly uninfluenced by any sorting. The Danish material from 1905 and 1906 is small except for May, when as many as approximately 2800 and 2200 measurements respectively are at hand. It is nevertheless striking that, for each of these samples, a'_{26} is greater than for the corresponding English samples. This suggests, that the English fishing has taken place on the whole at greater depths, and that the number of plaice of 26 cm in the Danish samples is uninfluenced or almost so by sorting. Considering the values for 1919 we find their deviation from the 1905—1907 values in good accordance with the frequency curves for plaice over 27 cm [2]), which shews that the curves in the neigbourhood of 27 cm in 1919 are for each month below the curves for 1904—1906. We cannot, however, be sure that the Danish measurements for 1919 and 1905—1906 are directly comparable for this purpose, since an alteration in the size of plaice as that which has occurred between the two periods of measurement will very likely have altered the sorting to some degree, so that a much greater percentage of plaice of 26 cm were discarded in 1919, because a greater percentage of larger plaice were at disposal.

Suppose we take the extreme standpoint that the difference between the values found for a'_{26} in 1919 and those from the English measurements are entirely due to sorting, what would be the percentage (d) of discarded fish of 26 cm? For April d is 22, for June, July and August d is 35 or less and for May less than 50. If therefore in the following calculations we estimate for periods from the middle of one month to the middle of the next following

$$0 < d < 35,$$

except for the period from the middle of May to the middle of June, for which we estimate

$0 < d < 50$, we think these are fair assumptions.

The actual percentage of plaice of 26 cm, a_{26}, in the stock would then for 1919 be $\frac{a'_{26}}{1 - \frac{d}{100}}$.

With this it would be possible to calculate limits for the percentage of plaice over 33 cm after the period of growth from the expression (I), which is now reduced to

$$\frac{\sum_{32}^{\infty} a_n}{1 + \frac{a'_{26}}{100 - d}}. \qquad \text{(II)}$$

In this calculation however we have only considered the process of growth and we shall have to examine how this result is affected when the effects of capture and death from other causes are taken into account. One may suppose the latter factor to produce the same percentage of reduction in the number of each of the length over 26 cm, but as mentioned the plaice of 26 cm may be less exposed to be brought to land by the Danish fishermen and presumably they mostly recover when discarded from the Danish cutters. The percentage of plaice of 26 cm left in the stock accordingly depends upon the extent of the Danish fishery.

[1]) Report on the Research Work of the Board of Agriculture and Fisheries in relation to Plaice Fisheries. Vol. I & II 1908—1909.
[2]) l. c. pp. 15—17.

Let us suppose that the percentage caught of each of the sizes over 26 cm during the period of growth considered is c. After the period of growth the composition of the stock of plaice over 27 cm will then approximately be:

$$\text{for 27 cm} \ldots\ldots\ldots\ a_{26}\left\{1-\frac{c}{100}\left(1-\frac{d}{100}\right)\right\} \text{ and}$$

$$\text{for any length n over 27 cm} \ldots\ldots\ldots\ a_{n-1}\left(1-\frac{c}{100}\right).$$

Hence the percentage of plaice of 27 cm, as we find it after the one-cm-growth-period, has increased by the ratio

$$r=\frac{1-\frac{c}{100}\left(1-\frac{d}{100}\right)}{1-\frac{c}{100}}$$

owing to the discarding of plaice of 26 cm.

The percentage of plaice over 33 cm after the period of growth is therefore according to II equal to

$$P=\frac{\sum_{32}^{\infty}a_n}{1+\frac{ra'_{26}}{100-d}}.$$

We shall next examine how long it takes for a fish of 26—32 cm to increase its length by 1 cm. From the Danish marking experiments undertaken in the years 1903—1912 it appears that the rate of growth in the areas A_3 and B_4 has the following monthly average values[1]), when calculated from the middle of one month to the middle of the next.

Average Rate of Growth (cm) in A_3 and B_4. 1903—1912.

April — May	May — June	June — July	July — Aug.	Aug. — Sept.
abt. 0.5 (max. 0.7)	0.8 (min. 0.5)	1,1	1.0	abt. 0.5 (max. 1.0),

The period of growth, i. e. the amount of time for unit increase in length, is thus between the middle of May and middle of August, approximately one month and for the spring and late summer more than one month. For each of these periods the percentage of catching (c) can be supposed to lie below the limit 40. Together with the limits assumed for d, this fixes the limits for the ratio r.

We find for May—June $1.000 < r < 1.333$ and for the other months considered $1.000 < r < 1.233$.

After the period of growth commencing at the middle of May we hence find

$$\frac{\sum_{32}^{\infty}a_n}{1+\cdot0100\,a'_{26}} > P > \frac{\sum_{32}^{\infty}a_n}{1+\cdot0267\,a'_{26}},$$

and after the other periods

$$\frac{\sum_{32}^{\infty}a_n}{1+\cdot0100\,a'_{26}} > P > \frac{\sum_{32}^{\infty}a_n}{1+\cdot0190\,a'_{26}}.$$

These results will now be applied to the area $A_{3,b}$. For this area we find the following values for a'_{26}:

April	May	June	July	Aug.
23.9	12.5	21.1	24.2	23.6

These values are calculated as mean values of the percentages found for the single samples[2]).

[1]) Calculated from Fig. 25 p. 32 in JOHANSEN: Contribution to the Biology ... VII (Medd. fra Komm. f. Havunders. Vol. IV 1915).

[2]) They differ from the values of Table 11, partly because the values of this table concern the whole area A_3 and partly because of the different method of calculation. It is clear, that by taking mean values of percentages of plaice over 27 cm, a greater weight is given to samples containing relatively many plaice under 27 cm, than by adding the samples and then calculating the percentages. There will thus be a systematic deviation between results calculated by the two methods. On the whole the percentage of smaller plaice is diminished and that of the larger plaice increased by the latter method.

In Table 10 are entered $\sum_{33}^{\infty} a_n$ and a_{32} calculated by the same method. We are thus in a position to calculate the limits of P. The results are given in Table 12.

Table 12. Number of Plaice over 33 cm. per 100 Plaice over 27 cm. in A_3, b 1919.

		April	May	June	July	Aug.	Sept.
Actually found		7.4 ± 1.3	23.3 ± 2.4	15.9 ± 1.4	16.3 ± 1.1	11.7 ± 0.9	18.6 ± 1.0
After period of growth, calc.	Higher limit	10.6 (± 1.9)	27.7	18.4	17.5	14.4 (± 1.1)	
	Lower limit	9.0	23.4 (± 2.4)	16.1 (± 1.4)	14.9 (± 1.0)	12.3	
Average depth of fishing-places in m.		10	11	15	17	17	16.5

This table contains, in the first line, the percentage of plaice over 33 cm actually found (see Table 10), and in the second and third line a higher and a lower limit for the value which this percentage would take efter the period of growth considered, if no migrations took place. The standard deviations stated for the »limits« are calculated as proportional to those of the »actually found« percentages.

It is obvious at the first glance that but for migrations the percentage of plaice over 33 cm would on the whole increase during all of the months considered except during July—Aug.

The calculated and actually found percentage will be compared from month to month. Under April is given the percentage actually found for April and the percentage calculated from this value which would occur after the period of growth if no migrations took place. We shall therefore compare this value with the percentage actually found in May. As the rate of growth found for the period from the middle of April to the middle of May is on an average 0.5 cm and as the maximum value observed is 0.7 cm, the period of growth considered is more than one month. Nevertheless when the calculated percentage at the end of this period is 10.6 at the most while the value found for May is 23.3 it is obvious that the considerable increase in the percentage of plaice over 33 cm must be ascribed to an immigration into the Area $A_{3,b}$ of larger plaice from deeper waters. From the middle of May to the middle of June the period of growth considered is about 1 month, so that if no migrations took place we should expect the percentage calculated from May to agree with that actually found for June. The difference is at least 7.5 for May and the st. d. of the difference is only 2.8. It is hence highly probable, that the percentage has been altered by immigration of smaller plaice from $A_{3,a}$ or emigration of larger plaice to B_4. This is also indicated by the seawards movement of the fishing places, from the average depth 11 m in May to 15 m in June, a change which moreover makes the difference found still more striking than it would have been if the fishing had taken place at the same depth during the two months. The period of growth commencing in the middle of June is equal to one month and the percentage calculated for the end of that time is therefore directly comparable with the percentage found for July. No deviation can be pointed out between these two values, so that there is no other trace of migration than that indicated by a further increase of the average depth of the fishing-places from 15 to 17 m. From the middle of July the period of growth is again one month, and while from the calculation we should expect stability, the value actually found for August shows a decrease of at least 3.2 which is 2.4 times its st. d. The average depth namely 17 m of the fishing-places is unaltered so that during this period also migration of the larger plaice seawards is highly probable. Although from the middle of August the period of growth considered is more than one month, the percentage calculated

for the end of that time is smaller than that found for September, the deviation being at least 4.2, which is nearly three times its. st. d. As the fishing-places have during the time been moved rather coastwards than seawards there must have been a coastwards migration of larger fish to account for the increased percentage of plaice over 33 cm.

We have thus found that both the maximum percentage of plaice over 33 cm found in May and the increase in September as well as the intervening minimum must be explained by migrations. By means of Tables 3 and 4 we are able to fix the point of time for the invasion of larger plaice at the middle of May when it can be traced as far coastwards as at 7—8 m's depth in $A_3 B_{4n}$. The movement soon turns into a seaward, but apparently slower one which lasts until August, after which a coastward movement can again be traced.

These results agree essentially with the information gained from the various marking experiments[1]). They have shewn that the stock of marketable plaice west of Esbjerg had in the spring months of March and April a tendency to move into more shallow water, while in the month of June a migration into greater depths was noticed. The return movement is not so well demonstrated by the marking experiments, but an experiment on the 11th of Sept. 1912[2]), when the plaice were put out at 25 m and 21 m near the Vyl Light-ship, shews a decided tendency to move towards shallower water.

From the measurements in May and June 1920 we find results closely agreeing with those obtained for the same month of 1919. After the period of growth considered we find starting from the distribution of length found in May, when a'_{26} is 13.5, that the lower limit for the percentage of plaice over 33 cm would be 23.6 assuming no migrations. Although the fishing has taken place at greater depths in June than in May the percentage actually found in June is only 14.1 ± 1.0.

Tables 3 and 4 tend to shew that the invasion of larger plaice culminates in the last decade of May.

6. Frequencies of length in area B_4.

On plaice from B_4 only a small number of measurements[3]) have been undertaken previous to 1919, and the value of these measurements is diminished moreover because the position of the fishing-place of the individual samples cannot be traced for measurements previous to 1916. The distribution of frequencies calculated per 1000 of plaice are given in Table 13 for the total of samples per month.

At the foot of the table is given the distribution of samples among the subareas used in 3. of this section. It is striking that the area B_4 ss in 1920 in June as well as in May is more frequently represented than the other three areas taken together, and it is, at the outset, probable that this in a degree accounts for the great precentage of plaice over 32 cm for these months. The results for 1916 are obscured by an unusually large precentage of plaice under 27 cm, presumably due to a different sorting, and the comparison for August and September between 1905 and 1919 seems also to be rendered difficult owing to a different sorting.

To eliminate these difficulties we have calculated Table 14, which only includes samples from the three northernmost subareas, and where the frequencies are calculated per 1000 of plaice over 27 cm.

For June and July we notice, from an earlier year to a later, an increase in the relative frequency of plaice over 33 cm. This agrees well with the results arrived at for $A_{3,b}$ except for 1920. While for $A_{3,b}$ in June we could not point out any difference between 1919 and 1920, the relative frequency of plaice over 33 cm is according to Table 14 in the part of B_4 north of 54° 30 N. Lat. 204 for June 1919

[1]) Vide A. C. Johansen: Contrib. to the Biology. . . . VII 1915 p. p. 16—17. (Medd. fra Komm. for Havunders., Serie Fiskeri. Vol. IV).

[2]) Vide l. c. p. 19.

[3]) Vide Johansen: Bericht über die dänischen Unters. über die Schollenfischerei. (Medd. fra Komm. for Havunders. Ser. Fish. III Nr. 8 1910 pp. 40—41).
and Johansen and Smith: l. c. pp. 30—31.

Table 13. Frequency of Length per 1000 of Plaice in Area B_4.

Length cm	May 1920	June 1905	June 1916	June 1919	June 1920	July 1905	July 1916	July 1919	August 1905	August 1919	September 1905	September 1919	Length cm
	Freq. from 12 sampl. from aver. depth 22 m	Freq. from 9 sampl. from aver. depth 23 m	Freq. from 6 sampl. from aver. depth 21 m	Freq. from 12 sampl. from aver. depth 22.5 m	Freq. from 91 sampl. from aver. depth 24 m	Freq. from 13 sampl. from aver. depth 27 m	Freq. from 9 sampl. from aver. depth 25 m	Freq. from 72 sampl. from aver. depth 23 m	Freq. from 18 sampl. from aver. depth 25 m	Freq. from 67 sampl. from aver. depth 22 m	Freq. from 14 sampl. from aver. depth 26 m	Freq. from 42 sampl. from aver. depth 22 m	
23	—	—	—	5	0.2	0.8	—	7	—	26.7	0.7	18	23
24	4	2	—	27	3	16	—	38	10	60	17	59	24
25	20	31	166	69	16	82	141	98	45	122	79	116	25
26	49	159	174	129	42	158	160	144	161	138	126	142	26
27	86	187	161	154	76	180	151	160	155	145	129	143	27
28	66	198	121	121	82	156	150	136	163	128	132	133	28
29	78	150	115	113	84	132	108	96	137	109	124	104	29
30	62	106	85	91	78	101	90	73	105	80	96	86	30
31	62	71	76	83	80	72	67	58	91	56	106	62	31
32	56	49	32	50	69	45	42	45	58	41	74	46	32
33	49	28	25	41	66	23	36	35	40	30	46	30	33
34	45	11	15	33	62	10	19	30	17	22	26	26	34
35	45	3	13	32	55	7	13	19	9	15	21	11	35
36	54	3	8	14	48	8	5	18	3	9	12	8	36
37	62	1	2	12	41	2	8	13	4	7	4	6	37
38	48	—	2	14	40	3	5	11	0.0	5	3	4	38
39	43	—	2	6	34	2	1	6	0.0	4	4	4	39
40	50	—	4	5	35	2	—	3	0.6	1	—	1	40
41	39	—	—	—	22	—	2	1	—	1	—	—	41
42	19	—	—	—	19	—	1	3		0.1	—	1	42
43	27	—	—	—	11	—	—	1	—	—	—	0.6	43
44	18	—	—	—	8	—	—	1	—	—	—	—	44
45	4	—	—	—	8	—	—	0.3	—	—	—	—	45
46	3	—	—	—	5	—	—	0.5	—	—	—	—	46
47	2	—	—	—	3	—	—	0.4	—	—	—	—	47
48	3	—	—	—	3	—	—	1.0	—	—	—	—	48
49	8	—	—	—	3	—	—	0.1	—	—	—	—	49
50	—	—	—	—	2	—	—	0.6	—	—	—	—	50
51	—	—	—	—	2	—	—	0.0	—	—	—	—	51
52	—	—	—	—	1	—	—	0.3	—	—	—	—	52
53	—	—	—	—	0.1	—	—	0.0	—	—	—	—	53
54	—	—	—	—	0.6	—	—	0.0	—	—	—	—	54
55	—	—	—	—	0.0	—	—	0.5	—	—	—	—	55
56	—	—	—	—	0.3	—	—	—	—	—	—	—	56
64	—	—	—	—	0.4	—	—	—	—	—	—	—	64
under 27	72	192	340	231	60	257	300	286	216	347	222	334	under 27
over 30	698	273	263	381	698	275	290	322	329	271	394	286	over 30
Average Length[1]	33.57	28.43	28.10	29.10	32.98	28.30	28.37	28.81	28.64	28.08	28.98	28.45	Average Length
Subarea	Numb. of sampl.		Numb. of sampl.	Numb. of sampl.	Numb. of sampl.		Numb. of sampl.	Nnmb. of sampl.		Numb. of sampl.		Numb. of sampl.	
B_4nn	0		0	3	1		2	10		30		20	
B_4n	1		6	6	3		7	20		25		17	
B_4s	4		0	3	28		0	42		12		5	
B_4ss	7		0	0	59		0	0		0		0	

[1]) To get the real average 0.5 has to be added.

and 411 for June 1920. In 1920 the fishing has however taken place chiefly in B_4 s and in 1919 in B_4 n. It appears that for the 4 samples of 1920 arising from B_4 nn and B_4 n the frequency of length over 33 cm is only 64, and for the 3 samples from B_4 s it is in 1919 as much as 309. It is therefore most probable

that the difference observed in Tables 13 and 14 between June 1919 and 1920 is due to a different origin of the samples.

Table 14. Frequencies of Length per 1000 of Plaice over 27 cm north of 54° 30′ N. Lat. in B_4.

Month	May	June				July			August		September	
Length in cm	1920	1905	1916	1919	1920	1905	1916	1919	1905	1919	1905	1919
27—30	353	662	602	505	365	630	586	549	580	585	495	571
30—33	269	280	292	291	224	293	284	247	324	271	355	291
over 33	378	57	106	204	411	77	130	204	96	144	152	138

For September 1919 we find (Table 14) a smaller relative frequency of plaice over 33 cm for B_4 than that found for $A_{3,b}$ (Table 10). It is in good accordance with the figures in Table 7, but it is extremely doubtful whether it represents the real condition. The relative frequency of larger plaice in B_4 for Sept. 1919 is also small as compared with that for Sept. 1905.

About the exact position of the fishing places, from which the samples for 1905 have come, we only know what can be gathered from reports of the plaice market in Esbjerg. From »Dansk Fiskeritidende« it appears that the plaice fishing from Esbjerg during August and September of 1905 was carried on almost exclusively in what we have called A_3B_4nn, but mostly farther northwards and seawards than in the same months of 1919. While the catches usually reported weigh at the most $5^1/_2$ kilogs. a score, special mention is made of the landing of plaice of 6—7 kilogs, the score, taken 20—25 miles N by W of Slugen in the middle of September. It is 8 samples of that size among a total of 14 samples in September 1905 which make the percentage of plaice over 33 cm so remarkably high. These catches of large plaice took place during a spell of fine weather after heavy westerly winds. It appears to follow from these reports that the 14 samples of September 1905 could hardly be considered normal for the locality at that time of the season.

In September 1919 the 20 samples from B_4nn are all from catches taken just north of Slugen. The relative frequency of plaice over 33 cm for these samples alone is 158 and therefore only just greater than the corresponding figure for 1905.

With this exception, to which we do not attach much weight after what has been gathered about the samples from September 1905, the samples for B_4 support the results found for area A_3, that the frequency of larger plaice in 1919 and 1920 is greater than in any previous period of measurement.

7. Length of plaice in area C_2.

The Danish plaice fishery in C_2 only takes place during the later part of the summer. We have for comparison with the 23 samples measured during July and September 1919[1]) only 26 samples taken during July, August and September 1916[2]). It has not been possible to trace any seasonal variation for these three months, and it seems fair to treat them jointly.

Table 15. Mean Value of Length and Percentage of Plaice over 40 cm among Plaice over 33 cm, with St. Ds.

Period of Measurement	Mean Value of Length in cm	Percentage over 40 among plaice over 33 cm
July—Sept. 1916	33.02 ± .43	23.5 ± 3.1
July and Sept. 1919 . . .	39.35 ± .84	49.1 ± 4.9
1919 — 1916 . . .	6.33 ± .95	25.6 ± 5.8

[1]) Vide »Table of Measurements«.

[2]) Vide Johansen and Smith: l. c. pp. 32—33.

The samples from C_2 are apparently less influenced by sorting than those from B_1 and A_3, and the average length is therefore more valuable as a characteristic. For each of the two periods of measurements the mean of the average length and the standard deviation of the mean have been calculated (Table 15). We find that the difference of the means is more than 6 cm, i. e. more than 6 times its st. d., which shews a significant increase of length from 1916 to 1919. Examining the position of the fishing-places we find that they do not differ essentially, so that the difference found entirely represents an alteration taken place in the course of time.

Taking the total number of samples for each period of measurement we find that those from 1916 contain 81 $^0/_{00}$ of plaice under 27 cm and those from 1919 only 7 $^0/_{00}$. To be quite free from any uncertainty as to different sorting we have also calculated the relative frequency of plaice over 40 cm among plaice over 33 cm. As it will be seen from the table, the mean of these frequencies is for 1916 less than half the mean for 1919, and the difference between the two means is 4.4 times its standard deviation. After this there is no doubt that the relative frequency of larger plaice in the eastern and central part of C_2, where the Danish fishery has taken place, has increased considerably from 1916 to 1919.

III. Age determinations of plaice from A_3 in 1920.

Age determinations by means of otolith examinations have in 1920 been undertaken on two samples from A_3. The samples have been taken in April, one from the Horns Reef grounds and the other from W. of Sild. The data are given in Tables 16 and 17.

Table 16. Size and Age of Plaice caught 4 miles S. W. of Cancer at the depth of 18 m on April 7. 1920.
All specimens except two apparently immature.

Sex . . .	♂							To-tal	♀							To-tal	♂ + ♀							To-tal
Age-group . . .	III	IV	V	VI	VII	VIII	?		III	IV	V	VI	VII	VIII	?		III	IV	V	VI	VII	VIII	?	
Length in cm																								
24	—	1	1	—	—	—	—	2	—	1	—	—	—	—	1	2	—	2	1	—	—	—	1	4
25	—	1	—	—	—	—	—	1	—	2	3	1	—	—	—	6	—	3	3	1	—	—	—	7
26	1	4	6	1	—	—	3	15	—	2	—	—	—	—	2	4	1	6	6	1	—	—	5	19
27	—	3	8	3	1	—	1	16	—	1	3	1	—	—	1	6	—	4	11	4	1	—	2	22
28	1	5[1]	1	3	—	—	3	13	1	4	3	4	—	—	—	12	2	9	4	7	—	—	3	25
29	—	2	3	5	3[3]	—	—	13	2	2	3	5	—	—	—	12	2	4	6	10	3	—	—	25
30	1	3	8	4	1	—	—	17	—	3	6	1	1	—	1	12	1	6	14	5	2	—	1	29
31	—	—	1[2]	4	—	—	—	5	—	1	3	6	—	—	1	11	—	1	4	10	—	—	1	16
32	—	1	1	2	1	1	-	6	—	2	2	5	—	—	—	9	—	3	3	7	1	1	—	15
33	—	—	—	2[3]	—	—	—	2	—	—	2	1	—	2	—	5	—	—	2	3	—	2	—	7
34	—	—	—	—	—	—	—	—	—	—	1	2	—	1	—	4	—	—	1	2	—	1	—	4
35	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	1	—	—	1
36	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	1	—	—	—	—	1
37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
38	—	—	—	—	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	—	—	—	—
39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	1	—	—	—	—	1
Total . . .	3	20	29	21	6	1	7	90	3	18	28	26	2	3	6	86	6	38	57	50	8	4	13	176
Aver. length . . (0.5 cm to be added)	28.0	27.7	28.6	29.6	29.3	32.0	27.0	28.4	28.7	28.2	30.0	30.2	32.5	33.3	27.3	29.6	28.3	27.9	29.0	29.9	30.1	33.0	27.2	29.0

[1]) One of these mature. [2]) Mature. [3]) One of these doubtful as to maturity.

Table 17. Size and Age of Plaice caught 6 miles W. of Hornum at the depth of 13 m on April 15. 1920.
All specimens except three apparently immature.

Sex . . .	♂							To-	♀							To-	♂ + ♂							To-
Age-group . . .	III	IV	V	VI	VII	VIII	?	tal	III	IV	V	VI	VII	VIII	?	tal	III	IV	V	VI	VII	VIII	?	tal
Length in cm																								
24	—	—	1	—	—	—	—	1	—	—	1	—	—	—	—	1	—	—	2	—	—	—	—	2
25	1	5	—	—	—	—	—	6	1	6	4	—	—	—	—	11	2	11	4	—	—	—	—	17
26	—	3	5	2	1	—	1	12	—	1	4	2	—	—	2	9	—	4	9	4	1	—	3	21
27	—	4	7	5	1	—	—	17	2	7	3	2	—	—	3	17	2	11	10	7	1	—	3	34
28	2	5	7	6	—	—	1	21	—	6	3	2	—	—	1	12	2	11	10	8	—	.	2	33
29	—	2	3	2	1	—	—	8	—	2	11	5	—	1	2	21	—	4	14	7	1	1	2	29
30	—	4	8[1]	3	—	—	—	15	—	4	2	7	—	—	1	14	—	8	10[1]	10	—	—	1	29
31	—	—	2	5[1]	—	1	1	9	—	1	4	5	2	—	1	13	—	1	6	10[1]	2	1	2	22
32	—	—	—	—	2	—	—	2	—	—	3	4	2	—	—	9	—	—	3	4	4	—	—	11
33	—	—	—	2	—	—	—	2	—	—	1	1	1	—	—	3	—	—	1	3	1	—	—	5
34	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	2	—	—	1	1	—	—	—	2
35	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	-	—	—	—	1	—	—	1
36	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	1	—	—	—	1
37	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	1	—	—	—	1
38	—	—	—	—	—	—	—	—	—	—	—	—	1[1]	—	—	1	—	-	—	—	1)	—	—	1
Total . . .	3	23	33	25	5	1	3	93	3	27	37	31	7	1	10	116	6	50	70	56	12	2	13	209
Average length (0.5 cm to be added)	27.0	27.2	28.1	29.0	29.2	31.0	28.3	28.2	26.3	27.5	28.6	30.3	33.1	29.0	28.0	28.9	26.7	27.4	28.4	29.7	31.5	30.0	28.1	28.6

[1]) One of these mature.

As in the two samples examined in 1919[1]) age-groups older than the IV-group form a prominent part of the samples. In a sample from April 1915[2]) taken W. of Sild a considerable number of plaice of the V-group was also present. But in samples taken in 1904[3]) and 1907[4]) from A_3 the V- and older age-groups were scarcely represented. The depth of the fishing-place near Sild, from which the sample in 1904 was taken, is unknown, but among the remaining samples mentioned one from 1919 is taken from 2 meter's depth near Fanø, while the average depth of the fishing-places from the samples in 1907 was abt. 14 m, so that a different locality does not seem to offer sufficient explanation of the different frequencies of older age-groups.

The samples from 1904 and 1907 have been taken by ottertrawl and the rest of the samples by »Snurrevaad«. As the latter are moreover sorted, the lengths for a given age-group are not directly com-

Table 18. Showing for Plaice over 27 cm from A_3 for each Age-Group the Average Length (— .5) and the Frequency per cent in brackets.

	19. III. 1904 Near Sild	27. IV.—7. V 1907 Various stations	25. IV. 1915 W of Sild	7. IV. 1920 SW of Cancer	15. IV. 1920 6 miles W of Hornum
Dept in m . . .	?	average abt. 14	16	18	13
II.	27.00 (2)	—	—	—	—
III.	28.07 (98)	27.88 (19)	27.00 (1)	28.80 (4)	27.50 (3)
IV.	—	29.27 (72)	28.67 (2)	29.00 (19)	28.34 (22)
V.	—	32.00 (5)	28.62 (32)	29.77 (34)	29.18 (35)
VI.	—	30.67 (3)	29.99 (59)	30.10 (35)	30.00 (33)
VII.	—	—	31.63 (6)	30.13 (6)	32.00 (7)
VIII.	—	—	—	33.00 (3)	30.00 (1)
XIV.	—	59.00 (1)	—	—	—

[1]) Johansen and Smith: l. c. p. 23.
[2]) A. C. Johansen: Contributions to the Biology . . , VII 1915, p. 27.
[3]) H. N. Maier: Beiträge zur Altersbestimmung der Fische I 1906 p. 102.
[4]) A. C. Johansen: Medd. fra Komm. for Havunders. Serie Fiskeri, Bd. III Nr. 8, 1910. Tables 60—65.

parable. We have therefore, for the samples available from March to April, calculated the average length for each age-group leaving out the specimens under 27 cm of length. The results are shewn in Table 18.

It should be noticed that the samples of 1904 were taken on March 19, so that the III-group will in 13 days become a IV-group, and must be compared with the IV-groups examined in April. The origin of the samples for 1907 is from various stations in the neighbourhood of Horns Reef. It appears from the table that the plaice are in this region larger than plaice of the same age taken from near Sild in 1904.

Comparing the IV groups of 1904 and 1907 with those in the samples of 1915 and 1920 we find that the average lengths of these latter samples fall between those of the first two. Among the three samples of 1915 and 1920 it is noticed that, for the age groups fairly numerously represented, the plaice from Cancer (Horns Reef) are in every case larger than those from W. of Sild. A corresponding difference is also noticed in the average length found in Tables 16 and 17, especially for the V-group, where the deviation found is 0.63 with standard deviation 0.46. It is seen from this that there is not much evidence that the difference is of real significance, and the other differences pointed out from Table 18 are hardly more certain. We may summarize as follows: there is some slight indication that plaice have a greater rate of growth in the northern part of A_3 (the Horns Reef grounds) than in the southern part (W. of Sild), while there is not much evidence that the rate of growth has changed in the course of years.

In Table 19 are given the average ages of plaice of a given length, the age simply indicated by mean values of indices. The means of the two samples agree closely, and the mean values of the means are represented in Fig. 2 together with the results of the previous analyses mentioned above. Considering the standard deviations[1]) we find great evidence that the average age of a certain length group has increased from 1904—1907 to 1915—1919—1920.

Table 19. Showing Average Age of Plaice from A_3 for each cm of Length. (Number of plaice in brackets).

Date	7. IV. 1920	15. IV. 1920
Fishing-place	SW of Cancer	6 miles W of Hornum
Depth m	18	13
Length cm		
24	4.33 (3)	5.00 (2)
25	4.71 (7)	4.12 (17)
26	4.50 (14)	5.11 (18)
27	5.10 ± .18 (20)	4.81 ± .18 (31)
28	4.73 ± .22 (22)	4.77 ± .17 (31)
29	5.32 ± .23 (25)	5.30 ± .18 (27)
30	5.04 ± .17 (28)	5.07 ± .15 (28)
31	5.60 (15)	5.80 ± .20 (20)
32	5.60 (15)	6.09 (11)
33	6.29 (7)	6.00 (5)
34	6.25 (4)	5.50 (2)
35	7.00 (1)	7.00 (1)
36	5.00 (1)	6.00 (1)
37	—	6.00 (1)
38	—	7.00 (1)
39	—	—
40	5.00 (1)	—
Correction to apply for referring length to April 1.	— .05	— .10

[1]) For previous years see JOHANSEN and SMITH: l. c. p. 25, Table XX.

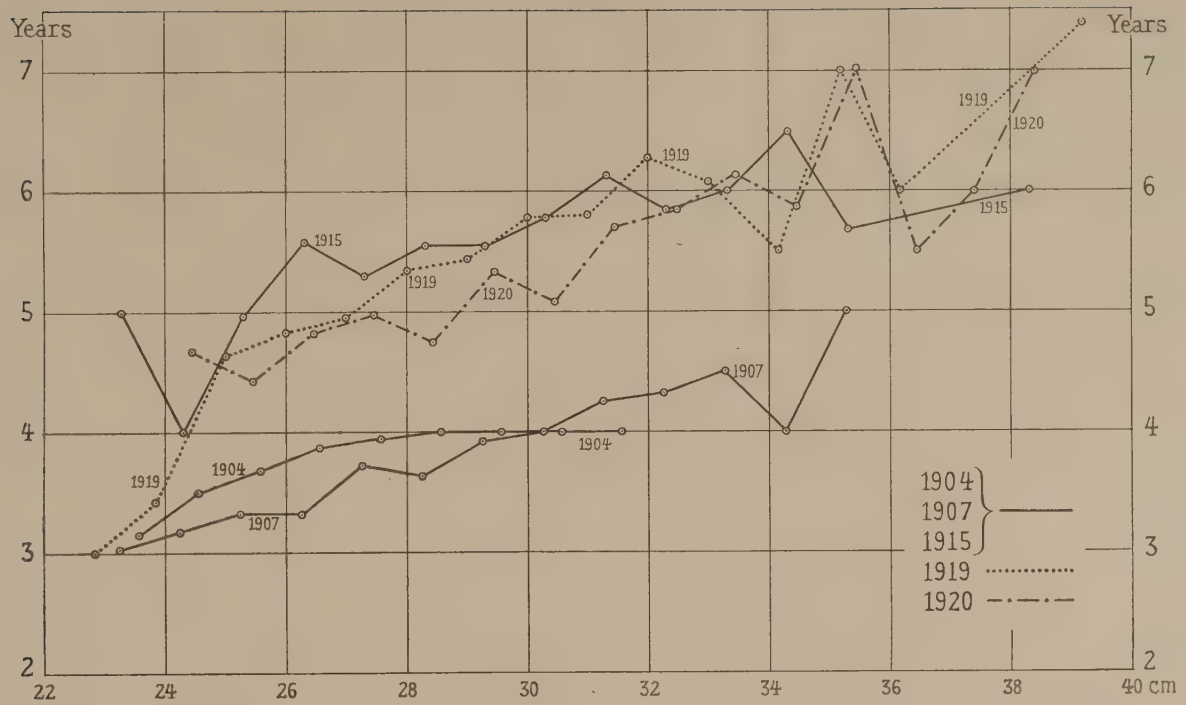

Fig. 2. Average Age of Plaice for given Length. (Age and length referred to April 1., length corrected by 0.5 cm).

Whether the differences between the five samples from these latter years signify is more doubtful. Comparing the means for the samples from Sild 1915 and W. of Hornum 1920, we find the differences for 27—29 cm to be 2, 3.5 and 1 times their standard deviations, whereas the differences between the means of the two samples from 1919 and the two from 1920 are smaller still. It is therefore possible that the relative frequency of older plaice in this area has reached a maximum before the spring of 1920.

IV. Concluding remarks.

By means of the new measurements of 1919 and 1920 now published the increased relative frequency of larger plaice in the areas $A_{3.b}$ and B_4, which was indicated by the measurements in April—June 1919, has been further established, and information has also been supplied about the area C_2, where a similar increase has been found between 1916 and 1919.

The age analyses of 1920, as well as those of 1919 shew in comparison with analyses of 1904 and 1907 an increased relative frequency of plaice of the V-group and of higher age-groups as well as an increased average age for a given length.

It is highly probable, that this higher average age is due to a lower chance of death by capture during the war than previously, and that the increased frequency of larger plaice must be explained by a greater relative frequency of older plaice.

Already in 1919 the yield of plaice from the North Sea has reached the pre-war quantity, and judged from the English statistics it is for 1920 even much greater. If therefore this explanation be the right one a few years of fishing at this rate must perceptibly influence the average age as well as the distribution of length of the marketable plaice.

I am greatly indebted to Dr. A. C. Johansen for information and criticism throughout this work.

Table of Measurements. — Length of Plaice
July—September 1919

Area	A_3														
	M_9	N_9	N_9	N_9	M_9	N_9	N_9	N_9	M_9	N_9	M_{10}	M_8	N_9	M_9	M_9
Date of capture	3.—4. VII 19	3.—4. VII 19	3.—4. VII 19	4. VII 19	4. VII 19	4. VII 19	4. VII 19	4. VII 19	4. VII 19	4. VII 19	6. VII 19	6. VII 19	6. VII 19	6. VII 19	6. VII 19
Fishing-place	20 miles SW of Graa Deep	15 miles NW of List	SW of Red Cliff Sand	13 miles SW by S of Graa Deep	16 miles SW of Graa Deep	17 miles SW by S of Graa Deep	18 miles SW by S of Graa Deep	3 miles S of Red Cliff Sand	20 miles SW of Graa Deep	17 miles SW by S of Graa Deep	20 miles NW of Graa Deep	41 miles SW by S of Graa Deep	16 miles SW by S of Graa Deep	20 miles SW of Graa Deep	18 miles SW of Graa Deep
Depth in m	19	15	17	18	19	17	19	19	17	19	17	19	17	19	19
Weight of catch in kg	400	500	2000	300	200	700	900	300	500	1400	1500	3000	2000	600	200
Weight of sample in kg	29	26	21	27	28	33.5	28	28	21	26	26.4	29	26.5	28	24
Length cm															
23	—	2	5	—	—	—	—	1	—	—	—	—	10	—	—
24	—	10	13	—	—	2	3	13	7	1	5	1	20	2	—
25	—	18	20	5	—	3	3	17	25	16	19	6	30	12	9
26	5	25	20	18	8	6	20	16	32	20	25	15	20	17	20
27	13	18	15	18	10	9	17	20	22	20	20	10	25	18	28
28	16	11	7	13	20	7	13	13	12	17	10	13	10	13	15
29	11	5	7	11	9	12	9	9	7	8	9	15	1	3	17
30	17	3	5	11	15	9	9	8	6	5	9	3	2	9	8
31	11	8	1	7	8	4	4	7	3	4	7	4	2	9	7
32	6	2	3	7	9	10	3	2	—	5	3	9	3	3	5
33	7	3	1	3	7	10	1	5	2	1	—	9	5	6	1
34	6	3	1	4	5	9	5	3	2	2	2	4	1	6	—
35	5	3	—	2	4	3	3	1	2	2	—	3	—	3	—
36	2	—	—	2	2	9	3	2	—	2	—	3	1	4	—
37	—	1	—	1	3	5	2	1	—	—	—	3	—	—	—
38	1	1	—	—	—	—	2	—	—	—	—	1	—	—	—
39	—	—	1	1	—	—	1	—	—	—	—	—	—	—	—
40	—	1	—	—	—	2	1	1	—	—	—	1	—	—	—
41	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—
42	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—
Total number	100	115	100	103	100	100	100	120	120	104	109	100	130	105	110
Average length cm *)	30.11	27.73	26.76	28.99	30.09	31.10	29.28	28.20	26.96	27.98	27.31	29.70	26.28	28.79	27.85

Area	A_3														
	M_9	M_8	M_8	M_8	M_8	M_8	M_8	M_9	N_9	M_8	M_9	N_9	N_8	M_9	N_8
Date of capture	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8.—9. VII 19	8.—9. VII 19	8.—9. VII 19	8.—9. VII 19	8.—9. VII 19	8.—10. VII 19	9. VII 19	9. VII 19	9.—10. VII 19	9.—10. VII 19	9.—10. VII 19
Fishing-place	20 miles SW of Graa Deep	32 miles SW of Graa Deep	35 miles SW by S of Graa Deep	42 miles SW by S of Graa Deep	40 miles SW by S of Graa Deep	33 miles SW ½ S of Graa Deep	34 miles SW of Graa Deep	25 miles SW of Graa Deep	16 miles SW ½ W of Graa Deep	40 miles SSW of Graa Deep	30 miles SW of Graa Deep	18 miles SW by S of Graa Deep	NW of Red Cliff	16 miles SW of Graa Deep	40 miles SSW of Graa Deep
Depth in m	17	17	19	19	19	15	19	19	19	15	19	17	17	17	19
Weight of catch in kg	400	1500	200	3000	1500	1800	1500	700	900	2500	500	1000	1000	800	1700
Weight of sample in kg	29.5	27.5	31	28.5	27.5	29	32	34	22.5	29	28	26	31	29.5	27.5
Length cm															
23	—	1	—	—	—	1	2	—	—	2	—	—	—	—	—
24	5	1	—	—	7	3	3	—	4	5	4	18	3	2	7
25	6	10	1	20	5	6	4	1	13	9	12	20	12	6	17
26	14	19	7	17	7	12	3	9	15	9	16	36	3	6	10
27	15	12	16	22	13	18	11	14	17	13	13	23	11	22	18
28	14	14	15	10	8	17	13	14	20	10	7	15	11	5	10
29	14	12	15	11	16	10	10	9	10	7	9	5	8	11	10
30	4	11	10	9	7	5	11	6	5	5	8	6	6	8	8
31	4	8	7	9	11	6	7	10	6	5	7	1	12	6	10
32	3	5	11	7	9	2	4	6	3	4	5	2	5	9	7
33	1	2	3	6	5	4	7	8	1	5	5	3	6	9	3
34	3	4	4	1	3	—	6	4	2	7	3	—	7	6	1
35	3	2	4	1	4	2	4	5	—	5	2	—	5	4	5
36	2	1	2	—	3	2	6	8	1	2	5	1	4	1	2
37	7	4	4	3	2	1	2	1	1	5	2	—	4	2	1
38	3	—	1	—	—	5	1	—	2	3	2	—	—	1	1
39	1	—	1	—	—	—	5	2	—	1	—	—	—	—	—
40		1	1	—	—	2	—	1	—	2	—	—	1	1	—
41	—	—	—	—	—	2	1	—	—	—	—	—	—	1	—
42	—	—	—	—	—	2	—	1	—	—	—	—	1	—	—
43	1	—	1	—	—	—	—	—	—	—	—	—	1	—	—
Total number	100	107	103	116	100	100	100	100 [3])	100	99	100	130	100	100	110
Average length cm *)	29.44	28.87	30.27	28.33	29.42	29.56	30.61	30.79	28.02	29.90	29.04	26.65	30.27	29.91	28.53

*) Not corrected by 0.5. — [1]) 45 cm: 2 spec.; 48 cm: 4 spec. — [2]) 43 cm: 1 spec. — [3]) 47 cm: 1 spec. — [4]) 44 cm: 1 spec.

Landed from Danish Cutters in Esbjerg.
and May—June 1920.

A3														Area
N_8	M_9	M_8	N_9	N_9	M_9 ?	M_9	M_9	N_9	M_9	M_9	N_9	M_9	M_8	
6. VII 19	6. VII 19	6. VII 19	5.—7. VII 19	5.—7. VII 19	6.—7. VII 19	7. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	Date of capture
35 miles SSW of Graa Deep	20 miles SW of Graa Deep	37 miles SW of Graa Deep	13 miles NW of List	18 miles SW by S of Graa Deep	15 miles of Graa Deep	18 miles W by S of Graa Deep	20 miles SW of Graa Deep	21 miles SW by S of Graa Deep	30 miles SW of Graa Deep	31 miles SW of Graa Deep	12 miles SW ½ S of Graa Deep	25 miles SW of Graa Deep	44 miles SW by S of Graa Deep	Fishing-place
18	19	17	16	19	13	15	19	18	17	18	17	19	19	Depth in m
1600	8000	2700	1200	900	800	200	350	600	500	2000	500	1400	1500	Weight of catch in kg
54	28.5	32	26	27.5	27.5	18.5	26.5	27	31	28	26.5	28	28	Weight of sample in kg
														Length cm
—	—	—	2	3	—	7	—	—	—	—	—	1	—	23
—	1	2	3	2	—	21	1	3	—	6	4	5	1	24
3	6	4	16	11	8	20	8	11	—	16	11	19	8	25
10	13	6	21	24	13	13	25	20	—	20	17	16	15	26
4	13	11	11	25	16	13	21	23	12	15	21	23	19	27
8	19	9	12	24	11	10	20	9	17	7	12	9	17	28
4	9	9	5	20	11	2	7	13	14	13	6	12	14	29
4	10	10	10	12	13	9	9	10	9	6	3	6	6	30
12	6	4	3	6	7	2	1	6	8	7	5	7	7	31
4	4	12	5	2	7	—	3	2	11	6	3	1	4	32
4	7	7	7	1	4	—	2	2	11	3	3	4	3	33
8	3	9	3	—	2	2	2	6	7	2	6	2	5	34
12	5	5	2	—	1	1	4	2	3	4	2	2	1	35
4	3	4	—	—	—	—	1	—	4	2	—	2	1	36
10	—	3	—	—	2	—	—	3	4	—	1	3	1	37
4	1	—	—	—	2	—	1	—	—	2	2	1	1	38
4	1	1	—	—	1	—	1	—	—	1	3	—	2	39
12	—	2	—	—	1	—	—	—	—	—	1	2	1	40
—	—	2	—	—	—	—	1	—	—	—	—	—	—	41
2	—	—	—	—	1	—	—	—	—	—	—	—	—	42
115 [1]	101	100	100	130	100	100	107	111 [2]	100	110	100	115	106	Total number
33.87	29.34	30.90	28.98	27.58	29.34	26.27	28.31	28.48	30.74	28.42	28.74	28.30	28.93	Average length cm

A3														Area
M_9	M_8	N_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	
9.—10. VII 19	10. VII 19	11.—12. VII 19	12.—13. VII 19	12.—13. VII 19	12.—13. VII 19	12.—13. VII 19	12.—13. VII 19	13. VII 19	14. VII 19	14.—15. VII 19	15. VII 19	16.—17. VII 19	16.—17. VII 19	Date of capture
27 miles SW by S of Graa Deep	35 miles SW by S of Graa Deep	44 miles SSW of Graa Deep	48 miles SW by S of Graa Deep	35 miles SW of Graa Deep	40 miles SW of Graa Deep	35 miles SW of Graa Deep	15 miles W of Hornum	40 miles SW by S of Graa Deep	40 miles SW by S of Graa Deep	34 miles SW by S of Graa Deep	36 miles SW by S of Graa Deep	34 miles SW of Graa Deep	41 miles SW by S of Graa Deep	Fishing-place
19	18	19	19	17	17	19	17	18	19	19	19	19	19	Depth in m
500	1500	900	2000	800	1000	1500	1200	600	700	1000	500	700	700	Weight of catch in kg
26.5	34	27.5	32	26.5	28.5	26.5	28	26	26	28	27.5	49.5	29.5	Weight of sample in kg
														Length cm
1	—	—	—	—	—	—	—	1	2	—	—	—	—	23
3	—	2	—	—	—	—	2	5	5	1	—	—	1	24
15	2	5	1	3	8	10	8	16	8	2	5	2	5	25
15	7	17	5	12	10	22	8	20	17	12	15	7	10	26
15	18	22	15	30	16	18	18	23	12	9	16	10	27	27
11	14	10	13	15	20	5	18	14	15	15	20	9	28	28
7	11	11	10	16	20	7	10	3	15	10	11	10	16	29
13	17	7	12	10	10	9	6	9	9	11	13	20	10	30
7	14	6	10	3	5	12	3	7	10	7	4	12	7	31
5	7	3	15	5	3	4	7	4	3	5	3	8	3	32
2	6	4	6	3	3	2	4	5	4	6	10	10	2	33
3	5	1	5	3	2	5	4	3	2	5	5	13	2	34
3	4	2	2	1	4	2	4	—	—	5	2	8	—	35
1	5	2	2	—	2	1	1	—	1	4	—	7	3	36
1	2	3	1	—	2	—	2	—	1	—	1	5	2	37
1	3	2	1	—	—	1	4	1	—	2	—	8	—	38
2	—	—	2	1	—	—	1	—	—	1	—	3	1	39
—	—	1	—	1	2	1	—	—	—	—	—	2	—	40
—	—	2	—	1	—	1	—	—	—	—	—	—	—	41
—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
105	115	100	100	104	107	100	100	111	104	95	105	135 [4]	117	Total number
28.62	30.20	29.17	30.27	28.75	29.12	28.82	29.42	27.77	28.23	29.98	29.02	31.90	28.67	Average length cm

Table of Measure-

Area	A_3														
	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_8	M_9	M_8	M_8	M_8	N_9	$M_{10}-N_9$
Date of capture	16.-17.-18. VII 19	17. VII 19	17. VII 19	17. VII 19	17.—18. VII 19	19.—20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20.—21. VII 19	20. VII 19	20.—21. VII 19	21. VII 19
Fishing-place	35 miles SW of Graa Deep	35 miles of Hornum	35 miles SW ½ S of Graa Deep	40 miles SW ½ S of Graa Deep	40 miles SW ½ W of Graa Deep	33 miles SW by S of Graa Deep	40 miles SW by S of Graa Deep	36 miles SW by S of Graa Deep	34 miles SW ½ S of Graa Deep	22 miles SW of Graa Deep	36 miles SW by S of Graa Deep	44 miles SW by S of Graa Deep	38 miles SW ½ S of Graa Deep	17 miles SSW of Graa Deep	Slugen
Depth in m	19	19	19	18	19	19	19	19	19	17	19	17	18	18	19
Weight of catch in kg	750	800	700	300	1000	1000	900	1000	750	800	500	—	600	1000	400
Weight of sample in kg	26.5	28	30.5	29	27.5	27	29	26.5	31.5	18	26	31	27	28	28
Length cm															
23	2	—	—	—	2	—	—	—	—	6	—	—	1	—	—
24	3	—	—	1	9	7	—	5	—	30	—	—	3	1	—
25	10	11	5	5	13	12	7	5	1	27	8	3	10	15	7
26	11	32	25	14	25	17	21	19	3	21	22	10	20	35	20
27	28	25	25	6	26	26	27	21	13	10	28	20	11	25	21
28	15	15	8	12	15	17	21	18	11	7	18	16	10	16	15
29	15	3	13	17	8	15	16	9	12	7	12	15	10	15	11
30	4	9	11	7	3	6	10	7	11	1	7	7	10	6	11
31	10	6	11	5	6	3	5	5	14	—	5	7	5	3	8
32	2	2	10	10	4	3	4	6	15	—	3	7	8	1	5
33	1	1	3	6	4	3	2	2	3	1	3	2	6	—	3
34	1	2	—	5	1	3	2	2	6	—	1	1	2	2	1
35	3	—	4	5	1	—	2	3	4	—	—	1	2	2	1
36	1	—	1	2	1	2	2	1	5	—	—	2	2	—	—
37	2	1	1	—	—	—	1	—	1	—	—	3	—	2	2
38	1	1	1	3	—	—	—	—	1	—	—	3	2	1	—
39	—	1	—	1	—	—	—	2	—	—	—	2	—	1	—
40	1	—	2	—	—	—	—	—	—	—	1	—	—	—	—
41	—	1	—	1	1	—	—	—	—	—	—	1	1	—	—
42	—	—	—	—	1	—	—	—	—	—	—	1	1	—	—
43	—	—	—	—	—	1	—	—	—	—	1	1	—	—	—
Total number	110	110	120	100	120	115	120	105	100	110	109	103 [1]	104	125	105
Average length cm	28.35	27.86	28.93	29.98	27.63	27.90	28.32	28.39	30.52	25.55	28.05	29.99	28.94	27.69	28.39

Area	A_3														
	N_9	N_9	N_9	N_9	M_9	N_{10}	N_9	N_9	N_9	N_9	N_9 ?	M_{10}	N_9 ?	N_9	N_8
Date of capture	26.—27. VII 19	26.—27. VII 19	26.—27. VII 19	26.—27. VII 19	26.—27. VII 19	27. VII 19	27. VII 19	28. VII 19	26.-27.-28. VII 19	27.—28. VII 19	27.—28. VII 19	28. VII 19	28. VII 19	28. VII 19	28.—29. VII 19
Fishing-place	18 miles SSW of Graa Deep	20 miles SSW of Graa Deep	14 miles SW of Graa Deep	18 miles SW by S of Graa Deep	28 miles SW of Graa Deep	Ulvetanden	20 miles SSW of Graa Deep	S of Red Cliff Sand	7 miles of Graa Deep	S of Red Cliff Sand	20 miles of Graa Deep	Slugen N	30 miles N of List	At Red Cliff Sand	32 miles SSW of Graa Deep
Depth in m	16	15	13	13	19	17	14	17	16	17	13	19	13	13	16
Weight of catch in kg	1000	800	2000	600	700	1100	2000	200	800	700	850	800	400	300	1300
Weight of sample in kg	27.5	25	24.5	28	27.5	29	26.5	27.5	26	29	27	29	24	27	34
Length cm															
23	—	5	4	—	—	3	2	—	2	—	—	4	—	—	—
24	—	13	11	7	1	—	4	4	11	2	2	10	4	2	2
25	6	24	17	13	6	16	12	15	33	5	13	15	18	6	7
26	8	22	22	15	11	16	27	15	35	8	31	25	25	21	8
27	13	25	18	28	25	16	29	30	26	20	31	20	25	33	11
28	27	8	17	24	25	16	28	25	21	15	16	15	15	10	12
29	12	12	11	15	20	13	12	20	4	9	19	9	10	9	15
30	3	7	8	9	18	11	6	8	3	8	8	6	11	10	10
31	10	1	5	6	5	9	3	5	—	7	—	5	2	4	6
32	10	—	—	2	2	3	4	2	1	3	2	3	2	5	6
33	3	—	1	2	—	6	2	—	—	8	1	3	2	3	6
34	4	3	1	—	—	2		—	—	4	—	1	—	2	4
35	2	1	—	1	—	1	—	—	—	6	—	—	1	—	11
36	1	1	—	—	—	—	—	—	—	1	—	1	—	1	3
37	1	—	—	—	1	—	—	—	—	1	—	—	—	1	3
38	—	—	—	—	—	—	—	—	—	—	—	—	—	1	4
39	—	—	1	—	—	—	—	—	—	2	1	—	—	—	1
40	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
41	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—		—	—	—	—	—	—	—	—	—	—
48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	100	122	116	122	114	112	129	124	136	100	124	117	115	110	109
Average length cm	29.11	26.72	27.03	27.60	28.17	28.11	27.33	27.50	26.27	29.57	27.35	27.16	27.29	28.35	30.33

[1]) 44 cm: 1 spec.

ments (continued).

A_3														Area
M_9	$M_{10}-N_9$	N_9	N_9	N_9	N_9	M_{10}	$M_{10}-N_9$	N_9	N_9	$M_{10}-N_9$	$M_{10}-N_9$	N_9	N_9	
21.—22. VII 19	24. VII 19	24. VII 19	24. VII 19	24. VII 19	25. VII 19	24.—25. VII 19	25. VII 19	25. VII 19	25. VII 19	25. VII 19	25. VII 19	25. VII 19	26.—27. VII 19	Date of capture
19 miles SW ¾ S of Graa Deep	Slugen	S of Red Cliff Sand	8 miles SW of Graa Deep	16 miles SSW of Graa Deep	At Red Cliff Sand	North Edge of Slugen	Slugen	8 miles W of List	16 miles SSW of Graa Deep	Slugen	Slugen	N of Red Cliff Sand	16 miles SSW of Graa Deep	Fishing-place
17	19	17	17	16	14	15	15	15	17	19	19	19	17	Depth in m
600	700	500	500	700	400	2000	750	400	1000	2500	2500	650	500	Weight of catch in kg
27.5	28	29.5	29	30	27	28	27	27	24	26.5	27	27.5	27.5	Weight of sample in kg
														Length cm
—	—	1	—	—	—	2	4	2	2	—	3	—	2	23
—	3	2	2	5	7	4	2	—	8	15	8	3	11	24
4	6	9	5	25	25	8	11	6	12	20	6	13	15	25
14	17	21	15	17	24	15	16	6	30	21	17	24	16	26
20	25	20	35	25	32	9	30	21	24	27	10	27	20	27
18	13	26	23	17	16	19	16	15	11	20	15	16	12	28
13	9	16	10	13	15	12	10	20	10	11	10	10	14	29
6	7	11	5	7	4	14	11	15	7	6	7	7	8	30
4	11	6	14	3	1	6	8	6	3	5	4	4	7	31
2	5	6	3	4	4	3	1	3	2	2	8	2	2	32
5	—	—	3	1	—	3	2	5	—	1	4	3	1	33
1	2	1	3	2	2	5	—	1	1	—	6	1	—	34
4	—	2	—	—	2	—	3	—	—	2	1	2	1	35
3	2	—	2	1	—	—	2	3	—	—	—	1	1	36
—	—	—	1	—	—	—	—	2	—	—	—	—	—	37
6	—	1	—	—	—	—	—	1	—	—	—	—	4	38
—	—	—	—	—	—	—	—	—	—	—	1	—	—	39
—	—	—	—	—	—	—	—	—	—	—	—	—	—	40
—	—	—	—	—	—	—	—	—	—	—	—	—	1	41
—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
100	100	122	121	120	132	100	116	106	110	130	100	113	115	Total number
29.28	28.15	28.07	28.36	27.36	27.13	28.26	27.86	28.96	26.95	27.05	28.33	27.65	27.83	Average length cm

A_3														Area
N_9	N_9	N_9	M_{10}	N_9	N_9	N_9	N_9	M_{10}	M_{10}	N_9	N_9	N_8	N_9	
28. - 29. VII 19	29. VII 19	29. VII 19	29. VII 19	28. - 29. VII 19	29. VII 19	29. VII 19	29. - 30. VII 19	29.—30. VII 19	29.—30. VII 19	29.—30. VII 19	29.—30. VII 19	29.—30. VII 19	29. - 30. VII 19	July 1919	Date of capture
At Red Cliff Sand	At Red Cliff Sand	Slugen S	Slugen N	S of Red Cliff Sand	At Red Cliff Sand	At Red Cliff Sand	20 miles SW by S of Graa Deep	Slugen N	Slugen N	W by N of Lister Deep	Off List	8 miles WNW of Red Cliff Light	At Red Cliff Sand		Fishing-place
18	14	14	19	17	19	19	17	19	19	14	14	18	15		Depth in m
350	700	800	1000	700	300	150	1000	1000	1300	800	700	600	600		Weight of catch in kg
26	25	27.5	28	24	23	26.5	29	27	28	37.5	27.5	28.5	28.5		Weight of sample in kg
														Total	Length cm
2	—	—	—	5	1	—	1	1	—	1	2	—	—	99	23
15	10	17	5	16	7	5	7	5	6	3	2	—	—	506	24
17	23	26	16	23	26	23	20	19	12	3	13	5	2	1281	25
21	33	35	13	21	35	24	22	29	11	2	18	6	22	1964	26
32	33	26	18	15	34	30	22	16	17	5	12	14	22	2270	27
18	21	11	16	19	18	17	18	20	13	11	7	14	20	1711	28
8	5	5	11	14	3	12	10	8	13	9	10	8	15	1265	29
8	6	4	15	7	1	7	7	4	7	8	17	6	10	954	30
4	4	3	4	—	—	7	7	8	9	8	6	8	5	706	31
3	—	1	2	2	—	2	3	1	3	5	8	7	5	503	32
—	—	—	1	—	—	1	1	1	3	7	3	2	5	380	33
—	—	2	2	—	—	—	2	—	3	6	4	7	5	330	34
1	—	—	2	—	—	—	2	3	—	7	2	3	1	248	35
—	—	1	—	1	—	—	1	—	3	7	5	4	—	186	36
—	—	—	1	—	—	—	2	—	—	5	—	3	1	137	37
—	—	—	—	—	—	—	—	—	—	4	—	—	—	95	38
—	—	—	—	—	—	—	—	—	—	3	—	2	—	56	39
—	—	—	—	—	—	—	—	—	—	3	—	—	—	19	40
—	—	—	—	—	—	—	—	—	—	2	—	—	—	24	41
—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	43
—	—	—	1	—	—	—	—	—	—	—	—	—	—	3	44
—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	45
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	46
—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	47
—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	48
—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	49
129	135	131	107	123	125	128	125	115	100	99	109	90	113	12794	Total number
26.91	26.67	26.50	28.05	26.61	26.32	27.16	27.64	27.25	28.24	31.94	28.75	30.29	28.61	28.47	Average length cm

Table of Measure-

Area	A_3												
	N_8	M_{10}	N_8	N_9	M_{10}	N_9	M_9	M_9	M_9	M_9	M_9	M_{10}	N_9
Date of capture	6. VIII 19	6. VIII 19	6. VIII 19	6. VIII 19	9.—10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19
Fishing-place	10 miles W of Red Cliff Light	Slugen N	23 miles SSW of Graa Deep	17 miles SSW of Graa Deep	Slugen N	At Graa Deep Light-Ship	9 miles W by N of Graa Deep	12 miles W of Graa Deep	SW of Cancer Gas Buoy	20 miles SW of Graa Deep	SW of Cancer Gas Buoy	Slugen N	10 ml. N of Graa Deep Light-Ship
Depth in m	15	17	15	15	13	15	15	17	16	19	15	16	19
Weight of catch in kg.	250	1000	600	400	1000	150	400	500	800	500	500	1000	500
Weight of sample in kg	27	29	29	26.5	27.5	34	26.5	27.5	27.5	30.5	28	28.5	27.5
Length cm													
23	—	—	—	—	—	—	2	—	—	—	1	2	—
24	3	5	5	3	6	3	14	2	2	3	2	10	—
25	6	9	9	13	11	3	27	12	16	2	10	20	2
26	16	12	12	21	10	11	30	25	20	14	11	20	5
27	20	10	15	31	21	13	15	18	21	17	22	20	17
28	20	18	15	15	13	16	17	18	20	11	25	13	22
29	13	4	10	10	16	15	12	11	10	6	13	11	20
30	15	11	10	11	13	7	5	13	8	12	18	10	15
31	7	10	7	7	6	13	2	10	3	6	7	6	5
32	—	10	5	4	3	3	3	4	6	4	6	5	11
33	4	4	7	1	3	9	1	3	2	2	3	2	7
34	1	3	5	2	2	7	2	1	1	7	1	1	1
35	2	—	2	—	1	4	—	1	—	6	1	—	—
36	—	2	1	—	—	—	—	—	—	3	—	—	—
37	—	2	2	—	—	1	—	—	—	1	—	—	—
38	—	—	—	—	—	—	—	—	—	2	—	—	—
39	—	—	—	—	—	—	—	—	1	1	—	—	—
40	—	—	1	—	—	—	—	—	—	1	—	—	—
41	—	—	—	—	—	—	—	—	—	2	—	—	—
42	—	—	1	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	107	100	110	118	105	105	130	118	110	100	120	120	105
Average length cm *)	28.21	28.87	29.36	27.68	28.08	29.41	26.73	27.99	27.72	29.97	28.29	28.29	29.11

Area	A_3												
	N_{10}	M_9	M_9	M_9	M_9	M_9	N_{10}	M_9	N_9	M_8	M_9	M_{10}	M_9
Date of capture	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	14. VIII 19	14. VIII 19	14. VIII 19	14. VIII 19	14. VIII 19
Fishing-place	10 miles N by W of Graa Deep	10 miles W of Graa Deep	16 miles W by S of Graa Deep	11 miles W of Graa Deep	9 miles W of Graa Deep	13 miles W by N of Graa Deep	8 miles NNW of Graa Deep	9 miles WNW of Graa Deep	8 miles W by S of Graa Deep	40 miles SW of Graa Deep	10 miles W of Graa Deep	20 miles NW of Graa Deep	10 miles W by S ½ S of Graa Deep
Depth in m	19	19	19	19	17	19	18	16	17	19	17	19	19
Weight of catch in kg.	500	300	500	1200	400	800	500	650	600	1000	500	500	500
Weight of sample in kg	26.5	28	29	27.5	27.5	28	28.5	26.5	26.5	26	28	20	34
Length cm													
23	—	—	—	—	8	—	—	2	2	3	—	1	—
24	4	3	—	2	20	4	—	2	8	21	5	16	1
25	22	7	5	8	25	15	3	16	20	31	13	16	—
26	20	12	12	15	15	33	18	20	24	27	14	28	2
27	17	16	13	13	8	23	20	21	11	23	17	28	6
28	18	12	35	10	16	15	20	21	18	15	22	15	17
29	15	26	23	15	7	10	20	13	15	11	15	5	14
30	10	15	17	17	5	15	8	13	7	4	17	2	18
31	7	11	9	8	5	6	13	5	2	2	5	—	16
32	1	9	7	6	7	4	6	3	4	1	7	1	14
33	3	1	1	8	3	1	4	3	4	—	4	—	5
34	1	—	—	1	1	—	1	—	4	—	1	—	6
35	—	1	—	2	1	—	1	1	—	—	—	—	2
36	—	1	—	1	—	—	—	—	1	—	—	—	2
37	—	—	—	1	—	—	—	—	—	1	—	—	3
38	1	—	—	—	—	—	—	—	—	—	—	—	2
39	—	—	—	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	1	—	—	—	—	—	1
Total number	119	114	122	107	121	127 [1])	115	120	120	139	120	112	109
Average length cm *)	27.60	28.63	28.53	28.93	26.80	27.59	28.69	27.68	27.52	26.34	28.12	26.32	30.66

*) Not corrected by 0.5. — [1]) 47 cm: 1 spec.

ments (continued).

A_3													Area
N_9	M_9	N_9	M_9	N_9	N_9	N_9	M_9	M_9	M_9	M_9	M_9	M_9	
10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10.—11. VIII 19	10.—11. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	Date of capture
At Graa Deep Light-Ship	12 miles WSW of Graa Deep	4 miles NW by N of Graa Deep	12 miles W of Graa Deep	20 miles SSW of Graa Deep	6 miles NW of Graa Deep	2 miles S of Slugen	25 miles SW by S of Graa Deep	20 miles SW of Graa Deep	10 miles W of Graa Deep	10 miles W by N of Graa Deep	1 ml. SW of Cancer Light Buoy	10—12 miles W of Graa Deep	Fishing-place
17	17	19	19	17	17	13	17	15	16	17	17	18	Depth in m
500	300	700	600	1400	400	600	250	400	300	700	600	400	Weight of catch in kg
28	26.5	27	26	38.5	29	27.5	26.5	27.5	25.5	26	27	26.5	Weight of sample in kg
													Length cm
2	8	—	—	—	2	—	—	6	8	—	11	1	23
1	9	—	2	3	20	6	2	15	17	4	24	5	24
5	11	3	18	5	18	8	9	27	20	16	17	10	25
10	8	7	33	11	25	8	15	14	35	21	23	7	26
25	13	7	44	20	15	15	15	8	18	16	29	20	27
19	13	14	20	14	17	15	12	17	14	18	14	15	28
14	13	20	8	13	10	7	20	11	4	21	12	12	29
18	16	18	3	11	2	3	15	10	4	6	3	14	30
6	12	15	2	8	5	3	6	3	3	8	4	8	31
5	3	5	1	8	2	4	1	2	3	—	1	7	32
4	2	5	—	8	2	3	4	5	2	2	2	9	33
—	3	3	—	3	1	3	1	2	—	2	—	1	34
2	—	—	—	3	3	—	2	3	—	—	—	1	35
—	—	2	—	3	3	2	—	1	—	—	—	—	36
1	1	—	—	3	1	4	2	3	—	—	—	—	37
—	1	1	—	1	—	1	—	1	—	—	—	—	38
—	—	1	—	1	1	3	—	—	—	—	—	—	39
—	—	—	—	—	1	—	—	—	—	—	—	—	40
—	—	—	—	1	—	1	1	—	—	—	—	—	41
—	—	—	—	—	—	2	—	—	—	—	—	—	42
—	—	—	—	1	—	2	—	—	—	—	—	—	43
112	113	101	131	117	128	90	105	128	128	114	140	110	Total number
28.51	28.02	29.69	26.87	29.72	27.33	29.76	28.60	27.56	26.34	27.62	26.34	28.55	Average length cm

A_3													Area
M_9	M_9	M_9	M_8	M_9	N_9	N_9	N_9	M_9	N_9	M_9	N_9	M_9	
14. VIII 19	14. VIII 19	14. VIII 19	15. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	Date of capture
15 miles W of Graa Deep	14 miles W of Graa Deep	16 miles SW of Graa Deep	35 miles SW of Graa Deep	12 miles W of Graa Deep	At Graa Deep Light-Ship	6 miles WNW of Graa Deep	4 miles W of Graa Deep	12 miles SW of Graa Deep Light-Ship	5 miles W by S of Graa Deep	12 miles W of Graa Deep	10 miles WSW of Graa Deep	12 miles W by S of Graa Deep	Fishing-place
17	16	19	19	14	19	15	13	17	17	17	19	19	Depth in m
1200	640	800	500	500	600	400	150	750	900	900	500	500	Weight of catch in kg
28	28	29	27	29	28	27.5	27.5	27.5	27	27	27	28	Weight of sample in kg
													Length cm
—	—	1	1	—	—	—	—	—	3	11	—	—	23
2	3	3	4	11	—	1	2	8	1	15	4	3	24
8	9	3	7	15	7	16	10	10	5	16	15	6	25
11	28	5	13	18	14	24	14	17	12	15	21	14	26
15	28	7	28	19	24	23	16	20	18	14	18	10	27
23	32	10	17	25	20	22	15	12	16	14	18	14	28
18	12	17	13	8	12	12	16	15	13	6	13	26	29
11	4	8	12	6	15	8	10	12	6	9	12	12	30
7	4	7	6	9	9	5	8	9	13	6	11	8	31
8	1	6	6	4	3	3	7	6	6	10	3	3	32
4	3	5	1	1	3	3	2	3	5	5	1	7	33
4	—	6	2	—	3	2	6	3	6	2	—	1	34
—	2	2	1	2	1	—	2	1	1	1	—	—	35
—	1	4	—	1	—	1	—	—	1	2	1	2	36
—	—	2	1	1	2	—	—	—	—	—	—	—	37
—	1	7	1	—	—	—	—	1	1	—	1	2	38
—	—	1	1	—	1	—	—	—	1	—	—	—	39
—	—	—	—	—	—	—	—	—	—	—	—	—	40
111	128	94	114	120	114	120	108	117	108	126	118	108	Total number
28.61	27.69	30.56	28.32	27.63	28.68	27.73	28.61	28.21	29.01	27.48	27.86	28.88	Average length cm

Table of Measure-

Area	A3												
	N_9	M_9	N_9	M_9	M_{10}	M_9	M_9	M_9	N_9	M_9	N_9	N_9	M_9
Date of capture	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	17. VIII 19	17. VIII 19
Fishing-place	7 miles W by N of Graa Deep	14 miles W by N of Graa Deep	5 miles W of Graa Deep	18 miles WSW of Graa Deep	Slugen N	16 miles SW of Graa Deep	20 miles SW of Graa Deep	14 miles WNW of Graa Deep	14 miles SW of Graa Deep	16 miles W of Graa Deep	16 miles SW by S of Graa Deep	S of Graa Deep Gas Buoy	17 miles SW of Graa Deep
Depth in m	15	17	16	15	19	19	19	15	18	17	19	11	19
Weight of catch in kg.	1000	1000	1500	800	700	100	1200	1000	800	750	1000	500	1000
Weight of sample in kg	27	28	29	28	27.5	35.5	26.5	28.5	26	27	—	26.5	26.5
Length cm													
23	—	—	—	7	—	—	—	3	2	—	23	—	3
24	1	—	4	12	—	—	2	—	3	5	43	2	14
25	17	5	10	12	3	5	14	11	12	21	39	6	20
26	17	18	18	23	9	15	10	20	17	25	17	9	16
27	18	15	20	21	9	13	15	35	27	18	12	13	16
28	22	20	18	14	18	16	17	20	13	21	6	15	10
29	12	15	16	15	24	20	16	16	11	8	4	15	12
30	7	10	11	7	12	14	12	9	12	6	1	14	7
31	6	7	13	8	7	11	7	1	7	3	—	8	11
32	7	6	4	7	6	10	4	2	7	3	—	12	5
33	3	2	3	2	6	1	2	3	1	2	—	6	4
34	1	1	—	3	3	3	2	3	1	—	—	1	—
35	1	5	1	—	—	5	2	—	—	1	—	1	1
36	—	2	1	—	—	2	—	1	1	2	—	—	1
37	—	1	—	—	—	1	3	—	—	1	—	—	—
38	—	1	—	—	—	2	—	—	—	—	—	—	—
39	1	1	—	—	—	1	1	—	—	—	—	—	—
Total number	113	109	120 [1])	131	97	120 [2])	107	124	114	116	145	102	120
Average length cm *)	28.04	29.02	28.28	27.41	29.08	29.59	28.62	27.70	27.86	27.41	24.94	28.99	27.46

Area	A3												
	M_9	M_9	M_9	M_9	N_9	N_9	N_9	N_9	N_9	M_9	M_9	N_8	N_9
Date of capture	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	20. VIII 19	20. VIII 19	20. VIII 19
Fishing-place	10 miles W of Graa Deep	12 miles W by N of Graa Deep	2 miles SW of Cancer	20 miles SW of Graa Deep	6 miles W of Graa Deep	SW of Red Cliff Sand	16 miles SSW of Graa Deep	16 miles SW by S of Graa Deep	6 miles W of Graa Deep	At Vyl Light-Ship	12 miles WSW of Graa Deep	NW of Red Cliff Light	2 miles WNW of Graa Deep
Depth in m	18	19	13	17	19	17	17	19	16	16	18	15	12
Weight of catch in kg.	600	1200	350	800	450	1500	400	1000	300	1000	800	900	100
Weight of sample in kg	28.5	26.5	27.5	34	26	30	26.5	27.5	26.5	29	26.5	28	23
Length cm													
23	—	—	—	—	—	1	—	—	—	—	2	—	—
24	9	9	4	—	1	7	5	7	14	6	5	12	12
25	13	17	13	5	8	12	13	10	37	10	15	38	23
26	15	20	37	9	21	12	16	12	27	8	26	35	38
27	22	30	25	12	28	15	7	20	22	10	25	18	20
28	18	13	25	15	18	13	15	12	16	11	17	11	16
29	15	12	15	10	7	10	7	10	10	8	13	13	7
30	11	9	5	13	12	10	11	7	5	15	13	3	4
31	6	4	6	10	5	11	8	3	1	9	3	1	1
32	8	4	2	5	7	6	4	7	3	5	1	1	2
33	2	—	—	7	1	7	5	3	—	7	4	—	1
34	3	2	1	7	1	1	2	4	1	3	2	—	—
35	—	—	—	3	3	8	—	1	—	3	—	1	—
36	—	—	—	2	2	1	2	3	—	4	—	1	—
37	—	—	—	2	—	—	1	—	—	1	1	—	—
38	—	—	—	3	—	—	1	1	—	2	—	—	—
39	—	—	—	2	—	1	1	—	—	—	—	—	—
40	—	—	—	3	—		1	—	—	—	—	—	—
41	—	—	—	1	—	—	1	—	—	—	—	—	—
42	—	—	—	1	—	—	—	—	—	1	—	—	—
43	—	—	—	—	—	—	—	—	—	—	—	—	—
44	—	—	—	—	—	—	—	—	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—	—	—
46	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	122	120	133	110	114	115	100	105	136	103	127	134	124
Average length cm *)	27.90	27.28	27.08	30.62	28.21	28.83	28.79	28.51	26.51	29.37	27.54	26.44	26.53

*) Not corrected by 0.5. — [1]) 40 cm: 1 spec. — [2]) 42 cm: 1 spec. — [3]) 44 cm: 1 spec.

ments (continued).

A3													
N_9	M_{10}	M_9	M_9	M_9	N_9	M_8	N_9	M_9	N_9	N_9	N_9?	N_9	Area
17. VIII 19	17.—18. VIII 19	17.—18. VIII 19	17.—18. VIII 19	17.—18. VIII 19	18. VIII 19	18. VIII 19	18. VIII 19	18.—19. VIII 19	18.—19. VIII 19	19. VIII 19	19.—20. VIII 19	19.—20. VIII 19	Date of capture
4 miles WNW of Graa Deep	Slugen N	18 miles WSW of Graa Deep	20 miles WSW of Graa Deep	20 miles SW of Graa Deep	5 miles NW by W of Graa Deep	39 miles SW of Graa Deep	7 miles NW by W of Graa Deep	16 miles WSW of Graa Deep	16 miles SSW of Graa Deep	5 miles W of Graa Deep	Esperance Bay	7 miles W of Graa Deep	Fishing-place
15	19	15	19	19	15	19	14	19	17	14	13	15	Depth in m
650	700	600	1000	1400	850	700	700	1000	1300	300	300	500	Weight of catch in kg
27	28.5	27	27.5	32	29	28.5	29	27.5	27.5	26	26	27.5	Weight of sample in kg
													Length cm
3	1	—	—	—	4	3	1	3	2	—	—	—	23
5	3	1	3	—	6	5	7	3	7	5	4	8	24
16	6	7	10	7	6	8	20	17	26	12	17	15	25
19	14	20	10	12	12	14	26	18	25	22	16	17	26
13	22	16	8	14	10	14	24	13	31	30	22	20	27
19	15	17	27	13	18	13	18	19	15	13	18	13	28
14	13	23	13	12	14	22	12	11	8	7	11	15	29
8	5	9	15	15	10	12	6	9	8	7	7	11	30
9	8	6	10	12	9	8	3	7	3	8	6	5	31
7	10	11	4	5	10	7	3	3	3	3	5	4	32
2	3	3	4	6	5	4	4	2	1	2	5	3	33
2	4	2	1	1	7	2	—	2	—	2	2	4	34
—	5	1	—	4	2	2	—	—	—	-	1	—	35
—	2	—	—	1	1	—	—	1	—	—	—	—	36
—	—	—	—	—	—	1	—	3	1	—	1	1	37
—	1	—	1	1	1	—	—	—	—	-	—	1	38
—	—	—	—	1	1	1	—	1	—	—	—	—	39
117	112	116	106	104	116	116	124	112	130	111	115	118 [3])	Total number
27.77	28.96	28.48	28.52	29.27	28.99	28.41	27.16	28.03	26.94	27.54	27.96	28.09	Average length cm

A3												
N_9	M_9	M_9	M_9	M_9	M_9	N_9	N_9	M_9	N_9	M_{10}	M_9		Area
20. 21. VIII 19	20.—21. VIII 19	20.—21. VIII 19	20.—21. VIII 19	21. VIII 19	21. VIII 19	21. VIII 19	21.—22. VIII 19	22.—23. VIII 19	26. VIII 19	26. VIII 19	27. VIII 19	August 1919	Date of capture
Esperance Bay	20 miles SW of Graa Deep	20 miles SW of Graa Deep	25 miles SW by S of Graa Deep	23 miles SW by W of Graa Deep	30 miles SW of Graa Deep	6 miles W of Lister Deep	20 miles SW by S of Graa Deep	20 miles SW of Graa Deep	3 miles S of Red Cliff Sand	Slugen N	23 miles SW ½ S of Graa Deep		Fishing-place
11	18	19	19	19	17	17	17	19	17	19	18		Depth in m
400	550	750	1000	900	400	900	900	600	400	600	200		Weight of catch in kg
28.5	26.5	26	27	30	31.5	27	27	32.5	28	26.5	27		Weight of sample in kg
												Total	Length cm
—	—	—	—	1	—	—	3	—	2	—	10	149	23
—	3	4	3	5	1	5	16	3	9	2	20	614	24
6	10	12	7	16	3	5	27	7	14	12	15	1305	25
18	17	15	15	10	6	10	15	7	8	25	19	1750	26
27	15	19	13	17	10	13	18	7	13	25	18	1859	27
32	17	9	10	17	13	15	12	12	12	25	8	1707	28
16	9	8	10	23	16	12	17	11	12	15	10	1341	29
3	10	5	10	7	13	10	5	8	9	10	7	1003	30
8	10	4	9	7	7	7	11	8	8	6	4	708	31
6	6	2	8	8	7	5	5	4	3	4	4	507	32
2	1	8	2	7	6	5	—	4	7	2	4	340	33
1	3	2	3	5	3	4	—	7	5	1	—	211	34
—	3	5	7	2	4	2	1	5	3	2	1	138	35
-	3	1	1	—	6	5	—	5	2	—		91	36
1	1	1	2	1	1	1	—	2	2	-	—	62	37
—	1	3	—	—	2	1		3	1	—	—	50	38
—	—	1	—	—	2	—	—	4	—	—	—	31	39
—	1	—	—	—	—	2	—	3	—	—	—	16	40
—	—	—	—	-	—	1	—	—	—	—	1	9	41
—	-	1	—	—	—	—	—	—	—	—	—	7	42
—	—	—	—	—	—	—		—	—	—	—	3	43
—	—	—	—	—	—	—	—	—	—	—	—	1	44
—	—	—	—	—	—	—	—	—	—	—	—	—	45
—	—	—	—	—	—	—	—	—	—	—	—	—	46
—	—	—	—	—	—	—	—	—	—	—	-	1	47
120	110	100	100	126	100	103	130	100	110	129	121	11903	Total number
28.12	28.83	28.96	29.16	28.54	30.31	29.59	27.07	30.78	28.72	27.84	26.85	28.13	Average length cm

Table of Measure-

Area	A_3													
	N_9	N_9	N_9	N_{10}	N_9	N_9	M_{10}	N_9	N_9	N_9	N_9	M_9	M_{10}	N_9
Date of capture	1. IX 19	1. IX 19	1. IX 19	1. IX 19	1. IX 19	1. IX 19	2. IX 19	2. IX 19	2. IX 19	2.–3. IX 19	2.–3. IX 19	2.–3. IX 19	2.–3. IX 19	2.–3. IX 19
Fishing-place	20 miles SSW of Graa Deep	7 miles SE of Cancer	4 miles WSW of Graa Deep	7 miles NW by N of Graa Deep	3 miles W of Graa Deep	3 miles SE of Cancer	Slugen N	At Red Cliff	3 miles W of Graa Deep	18 miles SSW of Graa Deep	18 miles SSW of Graa Deep	S of Cancer	Slugen N	26 miles SSW of Graa Deep
Depth in m	15	15	17	13	19	14	17	17	15	17	17	5	15	17
Weight of catch in kg	200	400	700	600	300	500	1000	1000	750	1000	1500	500	1000	1500
Weight of sample in kg	25	26.5	25	20.5	28	26.5	24	27	26	29	27.5	25	27	27.6
Length cm														
23	—	3	16	6	3	17	2	13	—	—	4	—	8	1
24	1	18	37	14	20	27	7	22	6	20	1	7	23	4
25	8	20	36	25	35	31	16	27	16	28	7	8	19	3
26	11	27	18	16	30	25	19	21	16	33	13	10	16	7
27	18	17	20	16	28	13	9	25	23	23	15	17	18	11
28	13	15	13	11	6	11	15	16	11	11	12	10	10	7
29	11	8	2	8	13	13	8	6	5	10	19	12	5	7
30	7	6	—	3	5	1	3	2	5	6	9	12	16	10
31	11	5	1	4	6	2	8	3	7	5	7	9	5	6
32	7	3	1	4	—	1	6	2	4	—	7	5	4	3
33	8	2	1	1	1	1	4	—	5	2	2	5	2	3
34	—	1	1	—	—	1	2	1	4	3	4	3	—	4
35	1	—	—	—	—	—	1	—	3	—	2	2	—	1
36	2	1	—	—	—	—	—	—	—	—	1	—	—	6
37	1	—	—	—	—	—	3	—	1	—	—	—	—	2
38	—	—	—	—	—	—	—	—	1	—	2	—	—	6
39	—	—	—	—	—	—	—	—	1	1	1	—	—	—
40	1	—	—	—	—	—	1	—	—	—	—	—	—	2
41	—	—	—	—	—	—	—	—	—	—	—	—	—	1
42	—	—	—	—	—	—	—	—	—	—	—	—	—	1
43	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	100	126	146	108	147	143	104	138	107	142	106	100	126	85
Average length cm *)	29.02	26.83	25.45	26.50	26.35	25.81	28.07	26.06	28.24	26.75	28.82	28.51	26.72	30.65

Area	A_3													
	N_9	N_9	N_9	N_9	N_9	N_9	M_9	M_{10}	N_9	N_8	M_{10}	N_8	N_8	N_9
Date of capture	3.–4. IX 19	3.–4. IX 19	4. IX 19	4.–5. IX 19	4.–5. IX 19	5.–6. IX 19	5.–6. IX 19	5.–6. IX 19	6. IX 19	6. IX 19	6.–7. IX 19	6.–7. IX 19	6.–7. IX 19	6.–7. IX 19
Fishing-place	Off Lister Deep	At Red Cliff Sand	3 miles SW of Graa Deep	8 miles W of Graa Deep	S of Slugen	SW of Red Cliff Sand	20 miles SW of Graa Deep	W of Slugen	26 miles SSW of Graa Deep	NW of Red Cliff	Slugen N	WNW of Red Cliff Light	10 miles SW of Red Cliff Light	22 miles SW by S of Graa Deep
Depth in m	15	17	13	17	15	16	19	19	17	15	19	15	19	17
Weight of catch in kg	700	1000	300	400	400	1500	1800	500	1000	1500	1000	900	700	1000
Weight of sample in kg	21	29	22.5	24	27	26.5	29	28	28	32.5	28.5	35	34.5	30.5
Length cm														
23	34	2	6	16	—	2	—	2	3	—	2	—	—	—
24	29	8	31	27	4	12	2	14	4	1	5	—	—	1
25	23	15	37	31	17	16	5	27	4	6	14	—	4	4
26	20	16	30	21	28	25	5	19	17	7	12	5	7	5
27	13	20	16	17	22	24	9	15	8	8	12	5	12	8
28	5	15	4	8	22	15	20	11	10	12	13	10	9	15
29	9	6	2	8	13	11	10	12	10	14	13	10	9	11
30	—	10	2	2	11	6	8	9	9	12	4	15	14	14
31	—	10	1	3	5	5	10	4	12	7	8	14	10	9
32	—	4	—	—	5	2	6	4	5	8	6	9	4	13
33	—	2	1	—	2	2	4	1	6	6	3	10	7	—
34	—	2	—	—	1	1	9	3	3	3	1	8	9	6
35	—	7	—	—	—	—	5	2	1	2	3	4	2	1
36	—	1	—	—	—	—	2	1	1	5	6	1	2	3
37	—	1	—	—	—	1	3	1	2	5	1	2	3	5
38	—	—	—	—	—	—	—	1	2	2	—	3	1	2
39	—	1	—	—	—	—	—	—	—	1	1	—	7	1
40	—	—	—	—	—	—	1	—	2	3	—	2	2	2
41	—	—	—	—	—	—	—	—	—	2	—	—	—	—
42	—	—	—	—	—	1	—	—	—	—	—	2	—	—
43	—	—	—	—	—	—	—	—	1	—	—	—	1	—
44	—	—	—	—	—	—	—	—	—	1	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	133	120	130	133	130	123	99	126	100	106 [3])	104	100	103	100
Average length cm *)	25.00	28.27	25.48	25.60	27.55	27.23	30.04	27.38	29.39	31.06	28.68	31.37	31.08	30.51

*) Not corrected by 0.5 — [1]) 46 cm: 1 spec. — [2]) 45 cm: 1 spec. — [3]) 49 cm: 1 spec. — [4]) 47 cm: 1 spec.

ments (continued).

A3														Area
N_9	M_{10}	N_9	N_8	N_9	M_9	N_9	M_9	M_9	M_9	N_8	N_9	M_9	N_8	
2.—3. IX 19	2.—3. IX 19	2.—3. IX 19	3. IX 19	3. IX 19	3. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	Date of capture
15 miles SSW of Graa Deep	Slugen N	16 miles SSW of Graa Deep	8 miles WNW of Red Cliff	17 miles SSW of Graa Deep	24 miles SW by S of Graa Deep	20 miles SSW of Graa Deep	20 miles SW of Graa Deep	30 miles SW of Graa Deep	16 miles SW of Graa Deep	WNW of Red Cliff	18 miles SW by S of Graa Deep	25 miles SW of Graa Deep	6 miles WNW of Red Cliff	Fishing-place
19	17	16	17	17	17	19	19	17	19	15	19	19	16	Depth in m
500	1500	1200	800	1000	200	1500	1600	850	1000	1500	1000	700	1500	Weight of catch in kg
28	33	29.5	41.5	27	33	33	28	27.5	—	28	28.5	27	29.5	Weight of sample in kg
														Length cm
21	1	3	—	4	3	1	2	1	1	1	—	—	1	23
16	6	3	3	26	3	4	1	3	2		—	1	5	24
26	8	1	4	49	8	10	5	4	14	10	4	12	7	25
20	10	10	10	23	12	11	15	8	20	15	6	12	10	26
14	15	8	10	12	11	15	21	14	23	20	12	16	10	27
15	4	15	15	13	9	16	18	18	20	20	13	11	10	28
9	9	10	18	8	11	17	12	13	15	8	17	10	15	29
6	7	12	16	7	9	12	10	6	9	13	15	10	5	30
7	5	12	16	2	12	4	11	10	7	6	6	10	8	31
2	9	7	8	—	4	6	4	7	—	3	7	6	4	32
1	4	5	3	—	3	5	4	7	4	5	6	1	6	33
3	7	5	2	—	6	3	5	2	3	2	6	3	4	34
—	4	2	8	1	3	2	—	2	1	5	2	2	6	35
—	4	2	2	—	2	3	1	1	—	1	4	2	2	36
—	4	1	2	—	2	-	1	1	—		—	1	2	37
—	2	2	2	—	2	4	1	1	1	—	—	—	—	38
—	—	1	4	—	1	3	—	—	—	1	—	—	3	39
—	1	—	3	—	2	-	1	—	—	—	1	2	2	40
—	—	—	1	—	—	—	—	—	—	—	—	-	—	41
—	—	—	1	—	1	-	—	—	—	—	1	—	—	42
—	—	—	—	—	1	-	-	1	—	—	—	-		43
140	100	100 [1])	128	145	106 [2])	116	112	102	120	110	100	100 [2])	100	Total number
26.37	29.76	29.83	30.50	26.97	29.91	29.23	28.80	29.54	27.93	28.64	29.95	29.07	29.76	Average length cm

A3														Area
M_9	N_9	M_9	N_9	N_8	N_8	N_8	N_8	N_9	M_9	M_9	M_9	N_8	N_9	
6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	Date of capture
20 miles SW ½ S of Graa Deep	8 miles NW of Red Cliff	23 miles NW of Red Cliff Light	17 miles SSW of Graa Deep	8 miles W of Red Cliff Light	5 miles NW of Red Cliff Light	10 miles W by S of Red Cliff Light	At Red Cliff	26 miles SSW of Graa Deep	20 miles SW of Graa Deep	16 miles SW of Graa Deep	20 miles SW of Graa Deep	37 miles SSW of Graa Deep	SW of Red Cliff Sand	Fishing-place
17	17	16	17	19	15	17	19	17	17	19	18	17	19	Depth in m
800	1100	2500	800	2000	800	2000	1000	1500	700	800	1000	2000	800	Weight of catch in kg
28.5	27	34	27	26.5	30	29	26.5	27	27.5	29	27	27.5	31	Weight of sample in kg
														Length cm
—	—	—	—	—	2	—	1	—	—	—	1			23
2	2	1	4	2	3	—	11	7	—	2	6	—	—	24
8	6	—	10	6	4	2	8	9	8	21	8	2	1	25
5	13	5	7	5	8	5	10	16	17	18	22	9	-	26
10	17	5	8	6	11	7	9	21	27	17	15	15	7	27
13	15	15	10	23	11	13	12	12	10	17	14	15	15	28
10	9	3	11	19	10	21	11	20	10	12	10	12	13	29
7	15	9	6	14	10	9	7	6	6	7	8	14	18	30
8	6	12	11	7	10	13	9	7	6	3	4	14	8	31
17	5	8	7	4	6	12	5	6	1	5	6	5	9	32
8	5	6	2	4	5	4	3	5	2	3	4	4	8	33
3	1	9	2	4	5	4	4	2	2	3	2	1	5	34
2	2	5	5	4	3	4	5	2	2	3	2	3	4	35
2	1	6	—	1	—	1	2	2	—	1	1	2	6	36
1	—	2	—	—	1	2	2	—	1	1	1	2	4	37
1	2	2	2	—	4	—	1	—	—	1	2	-	1	38
1	1	8	2	—	3	3			3	—	1	2	1	39
1	—	3	—	—	1	—	—	—	1	1	1		-	40
—	1	1	1	—	2	-	-	—	2	-	-		-	41
—	—	—	1	—	—	-	-	—	1	1	—	—	—	42
—	—	—	1	—	1	—	—	—	—	—	—	-	-	43
1	—	—	—	—	—	-	-	—	—	—	—	—	-	44
—	2	—	—	—	—	—	—	—	1					45
100	104 [4])	100	90	100 [4])	100	100	100	115	100	116	108	100	100	Total number
30.10	29.52	32.12	29.74	29.41	30.34	30.34	28.88	28.31	29.06	28.33	28.52	29.66	31.02	Average length cm

Table of Measure-

Area	A_3													
	M_9	N_8	N_9	N_8	N_8	N_8	N_8	M_9	M_9	N_8	M_9	N_8	N_8	N_8
Date of capture	6.-7.-8. IX 19	7. IX 19	7. IX 19	7. IX 19	7. IX 19	7. IX 19	7. IX 19	7.—8. IX 19	7.—8. IX 19	7.—8. IX 19	7.—8. IX 19	8. IX 19	8. IX 19	8. IX 19
Fishing-place	25 miles SW of Graa Deep	NW of Red Cliff	3 miles SSE of Cancer	W of Red Cliff Light	28 miles SSW of Graa Deep	NNW of Red Cliff Light	NW of Red Cliff Light	28 miles SW by S of Graa Deep	27 miles SW by S of Graa Deep	W of Red Cliff Light	17 miles SW of Graa Deep	8 miles W of Red Cliff	WNW of Red Cliff	29 miles SSW of Graa Deep
Depth in m	17	16	13	16	15	13	17	19	16	17	18	17	16	15
Weight of catch in kg	500	300	500	1000	700	1500	500	600	600	500	650	500	800	1000
Weight of sample in kg	36	26.5	24	31	29	27	26.5	27	34	28	26.5	27	35	28
Length cm														
23	—	—	5	—	1	1	—	1	—	—	—	—	—	—
24	—	2	20	2	1	8	2	2	1	1	2	2	1	1
25	2	17	23	6	10	17	2	13	3	12	4	2	4	10
26	3	18	30	8	14	11	7	16	8	16	15	4	5	10
27	8	8	21	15	13	18	12	22	10	17	22	13	5	11
28	7	10	11	17	16	10	9	9	17	12	17	17	6	13
29	10	8	5	15	12	9	6	15	18	7	13	15	15	17
30	7	12	3	15	7	5	9	6	5	17	7	18	12	10
31	9	2	3	13	10	10	5	13	11	11	8	14	12	7
32	14	5	—	4	5	6	7	4	12	3	4	—	7	7
33	11	5	1	7	7	5	2	8	6	8	6	8	6	5
34	7	4	1	4	4	2	4	1	5	4	1	4	7	8
35	3	2	—	1	—	1	3	—	3	1	2	1	1	1
36	4	3	2	3	4	—	3	—	1	2	4	2	5	2
37	1	2	—	—	3	2	2	—	2	—	1	—	5	—
38	3	—	—	—	2	2	6	—	3	—	—	—	2	—
39	6	—	—	—	1	—	1	1	2	—	—	—	3	2
40	2	—	—	—	—	—	1	—	—	—	—	—	1	—
41	1	—	—	1	—	1	—	—	1	—	—	—	1	—
42	—	1	—	—	—	—	—	—	1	—	—	—	2	—
43	—	1	—	—	—	—	1	—	1	—	—	—	—	—
Total number	99 [1])	100	125	111	110	108	82	111	110	111	106	100	100	104
Average length cm *)	31.99	28.89	26.34	29.31	29.32	28.37	30.71	28.30	30.46	28.76	28.81	29.45	31.42	29.34

Area	A_3													
	M_{10}	M_9	N_9	N_9	M_9	M_{10}	N_9	N_8	N_8	N_9	N_9	N_9	N_9	N_8
Date of capture	10. IX 19	11. IX 19	11. IX 19	11. IX 19	11. IX 19	11. IX 19	12. IX 19	12. IX 19	12.—13. IX 19	12.—13. IX 19	12.-13.-14. IX 19	12.-13.-14. IX 19	12.-13.-14. IX 19	12.-13.-14. IX 19
Fishing-place	Slugen N	At Cancer	22 miles SSW of Graa Deep	7 miles NW of Red Cliff	SE of Cancer Barrel	Slugen N	5 miles WNW of List	10 miles W of Red Cliff	NNW of Red Cliff	18 miles SSW of Graa Deep	8 miles of List	20 miles S by W of Graa Deep	Off List	8 miles of Red Cliff
Depth in m	19	14	15	17	17	19	13	15	18	17	16	15	17	15
Weight of catch in kg	1000	500	1500	800	300	400	350	650	500	500	400	1000	400	500
Weight of sample in kg	28.5	26.5	30	27.5	27	27	26.5	28	44	27	32	29	32	28
Length cm														
23	—	7	—	—	—	—	—	—	—	—	2	2	—	—
24	3	26	3	2	6	6	1	—	—	5	12	2	3	6
25	11	32	10	11	14	15	12	6	3	8	18	8	5	15
26	19	19	7	14	15	22	16	12	4	18	29	7	8	22
27	20	19	13	10	17	11	22	17	1	24	19	15	14	12
28	18	18	8	14	16	18	17	20	5	24	18	11	7	18
29	19	3	15	7	7	11	11	15	4	11	13	10	16	6
30	5	8	11	5	10	6	13	11	5	13	9	7	11	3
31	4	1	7	13	7	5	4	4	7	9	5	2	4	6
32	3	1	8	8	8	4	9	6	9	3	5	13	8	4
33	3	—	2	4	2	4	1	7	9	3	3	10	11	2
34	2	—	6	5	1	2	2	2	11	—	3	5	5	2
35	1	1	2	2	1	—	1	2	9	—	2	1	3	2
36	—	—	4	2	2	1	1	2	12	—	—	5	3	2
37	1	—	5	—	2	—	—	1	3	—	—	2	1	2
38	1	—	1	—	—	—	—	—	5	—	—	—	3	2
39	—	—	—	1	—	—	—	1	3	—	—	—	—	—
40	—	—	1	2	—	—	—	—	4	—	1	—	—	1
41	—	—	1	—	—	—	—	—	3	—	—	—	1	2
42	—	—	1	—	—	—	—	—	3	—	1	—	1	—
43	—	—	—	—	—	—	—	—	—	—	1	—	—	—
44	—	—	—	—	—	—	—	—	—	—	—	—		
Total number	110	135	105	100	108	105	110	106	100	118	141	100	105 [2])	107
Average length cm *)	28.03	26.08	29.97	29.24	28.22	27.71	28.21	29.05	33.62	27.89	27.75	29.56	30.27	28.46

*) Not corrected by 0.5. — [1]) 44 cm: 1 spec. — [2]) 45 cm: 1 spec. — [3]) 47 cm: 1 spec.

ments (continued).

	A_3													Area
N_8	M_8	M_9	N_9	N_8	N_9	N_8	N_8	N_8	N_9	N_9	N_8	N_9	M_{10}	
8. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	8.—9. IX 19	9. IX 19	9.—10. IX 19	9.—10. IX 19	10. IX 19	Date of capture
8 miles W by S of Red Cliff Light	25 miles SW of Graa Deep	30 miles SW of Graa Deep	8 miles NW of Red Cliff	12 miles NW of Hornum	10 miles N of Red Cliff	12 miles W of Red Cliff	10 miles NW of Hornum	8 miles NW of Hornum	17 miles SSW of Graa Deep	25 miles SSW of Graa Deep	7 miles W by S of Red Cliff Light	10 miles NW of Red Cliff	Slugen N	Fishing-place
16	17	19	17	17	15	19	19	16	15	19	15	15	19	Depth in m
500	1000	200	500	1000	600	900	500	900	1000	400	1000	500	500	Weight of catch in kg
27.5	28	29	31	27	31.5	32.5	29	27	27	29	32	28	30.5	Weight of sample in kg
														Length cm
—	—	1	—	3	—	—	—	—	—	—	—	1	—	23
4	5	1	2	10	1	—	2	—	1	—	—	10	3	24
18	7	2	3	9	7	2	3	5	15	4	2	20	1	25
18	9	5	10	12	8	6	12	11	25	10	10	25	4	26
21	13	11	11	15	6	4	20	8	24	13	11	18	10	27
19	14	11	15	7	11	11	14	13	21	15	10	17	16	28
10	13	15	7	4	12	10	19	20	13	12	13	6	13	29
9	6	12	8	8	11	10	12	25	12	13	9	13	12	30
7	7	8	8	6	6	12	9	10	6	10	12	6	9	31
6	6	9	5	3	10	14	5	6	2	5	8	4	8	32
4	6	5	6	5	7	8	4	2	1	3	7	3	6	33
—	4	5	5	5	3	6	1	4	2	6	2	1	5	34
2	1	7	6	4	2	3	2	1	1	2	5	—	2	35
—	2	1	6	—	2	7	1	1	—	1	3	—	3	36
—	1	1	2	1	4	4	1	1	1	3	2	—	3	37
—	1	1	3	—	3	2	—	—	—	1	2	2	—	38
—	2	1	1	4	2	—	—	1	—	—	1	—	—	39
—	1	3	1	1	2	—	1	—	—	—	1	—	—	40
—	1	—	1	3	2	—	1	—	—	1	1	—	2	41
—	—	—	—	—	1	1	—		—	1	1	—		42
—	2	—	—	—	—	—	1	—	—	—	—	—	—	43
118	101	99	100	100	100	100	108	108	124	100	100	126	100	Total number
27.83	29.69	30.43	30.53	29.16	30.80	31.23	29.17	29.37	27.78	29.80	30.56	27.48	30.05	Average length cm

	A_3													Area
N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	M_8	N_9	M_9	
13. IX 19	13.—14. IX 19	13.-14.-15. IX 19	14. IX 19	14. IX 19	14.—15. IX 19	14.-15.-16. IX 19	15.—16. IX 19	15.—16. IX 19	16. IX 19	16.—17. IX 19	16.—17. IX 19	16.—17. IX 19	16.—17. IX 19	Date of capture
20 miles N of List	10 miles NW of Red Cliff	S of Red Cliff Sand	5 miles of Skal-lingen	18 miles SSW of Graa Deep	5 miles of Lister Gas Buoy	At Red Cliff Sand	10 miles NNW of Lister Deep	Slugen S	3 miles SE of Cancer	5 miles SW of Graa Deep	15 miles W of Hornum Light	9 miles W by S ½ S of Graa Deep	22 miles W by S of Graa Deep	Fishing-place
19	15	15	13	17	16	15	17	15	13	18	19	17	18	Depth in m
1000	600	700	250	1000	3000	400	900	500	500	200	3000	400	1000	Weight of catch in kg
23	27	27	26	27.5	26.5	31	29	26.5	22	27.5	29	27	27.5	Weight of sample in kg
														Length cm
—	—	1	—	1	5	—	—	2	2	—	—	—	—	23
1	11	—	6	5	10	2	2	24	6	19	3	2	6	24
11	23	7	20	19	25	5	7	31	25	25	21	15	16	25
22	23	9	36	18	20	9	7	25	21	23	20	23	18	26
13	30	15	28	19	11	15	8	20	26	21	21	20	11	27
11	18	10	20	5	12	14	13	8	13	11	16	15	14	28
8	10	26	9	6	7	8	21	5	3	13	7	15	6	29
10	4	13	8	15	8	10	12	1	6	6	15	7	11	30
2	1	9	2	3	9	8	7	2	5	7	4	8	5	31
2	1	6	—	5	5	6	10	1	—	2	6	5	5	32
2	2	3	—	4	4	3	5	4	1	—	2	2	2	33
6	3	1	—	6	1	1	2	3	1	1	2	—	3	34
—	2	—	—	3	—	7	1	—	1	—	1	2	1	35
1	—	—	—	2	—	2	1	1	—	—	2	1	1	36
—	—	—	—	1	1	5	—	—	—	—	1	—	4	37
1	—	3	—	1	1	1	1	—	—	—	—	—	1	38
—	—	1	—	—	1	2	—	—	—	—	1	—	—	39
—	—	—	—	—	—	1	2	—	—	1	—	—	2	40
—	—	1	—	—	—	—	—	—	—	—	—	—	1	41
—	—	—	—	—	—	1	—	—	—	—	—	—	—	42
—	—	—	—	—	—	—	1	—	—	—	—	—	—	43
—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
100	128	105	129	113	120	100	100	127	110	130 [2])	122	115	107	Total number
28.12	27.05	29.13	26.81	28.35	27.46	30.09	29.56	26.38	26.83	27.02	28.02	27.88	28 65	Average length cm

Table of Measure-

Area	A_3													
	N_8	N_9	N_8	M_9	N_9	N_8	N_9	N_8	N_8	N_8	N_8	N_9	N_9	N_8
Date of capture	16.—17. IX 19	16. 17. IX 19	16.-17.-18. IX 19	17. IX 19	17. IX 19	17. IX 19	17. IX 19	17. IX 19	17.—18. IX 19	17. 18. IX 19	17. 18. IX 19	17.—18. IX 19	17.—18. IX 19	17. 18. IX 19
Fishing-place	Off Hornum	18 miles SSW of Graa Deep	Off Sild	11 miles WSW of Vyl	20 miles SSW of Graa Deep	10 miles SW of Red Cliff	25 miles SSW of Graa Deep	8 miles NW of Red Cliff	NW of Red Cliff	NW of Red Cliff	NW of Red Cliff	20 miles SSW of Graa Deep Barrel	20 miles SW by S of Graa Deep	36 miles SSW of Graa Deep
Depth in m	17	15	9	19	17	19	15	15	17	15	16	15	17	19
Weight of catch in kg	450	100	1200	300	450	300	600	1200	1000	1000	600	400	500	1500
Weight of sample in kg	39	34.5	32	27	30	29	27	28	28	28	28	32.5	26	30
Length cm														
23		—	—	1	—	1	—	—				—	—	—
24	—	—	2	9	7	9	6	7	7	5	3	4	8	—
25	5	11	4	10	14	9	6	14	11	15	6	8	16	2
26	5	10	5	16	21	20	18	10	17	10	11	6	21	10
27	5	8	10	18	14	13	25	12	14	20	12	12	18	16
28	16	4	10	5	14	10	10	9	20	12	13	8	16	19
29	4	5	13	10	8	8	16	13	11	9	16	9	9	4
30	8	10	8	9	11	10	9	14	15	11	12	15	8	13
31	5	7	15	8	4	5	7	9	3	11	3	7	2	9
32	8	15	12	1	3	4	7	8	4	4	8	10	5	8
33	5	8	3	1	3	3	3	2	4	—	3	1	2	6
34	8	6	3	6	5	2	—	2	2	4	3	5	6	5
35	7	8	4	3	3	1	2	2	1	2	2	1	—	2
36	4	2	5	1	1	—	—	2	1	—	5	2	1	2
37	6	2	1	1	1	1	—	—	1	1	1	4	2	2
38	5	1	2	—	—	3	1	1	1	—	1	4	—	—
39	4	2	2	—	1	1	—	2	—	1	—	1	1	1
40	2	1	—	—	1	1	1	—	—	—	—	1	—	1
41	1	—	2	—	—	1	—	—	—	—	1	1	—	—
42	—	—	—	—	—	—	—	—	—	—	1	—	—	—
43	2	—	—	—	—	—	—	—	—	—	—	1	—	—
44	—	—	—	1	—	1	—	1	—	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—
48	—	—	—	—	—	—	—	—	—	—	—	—	—	—
49	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	100	100	101	100	111	103	111	108	112	105	101	100	115	100
Average length cm *)	32.06	30.55	30.57	28.30	28.31	28.61	28.28	28.91	28.21	28.31	29.49	30.21	27.95	29.78

Area	B_4													
	M_{11}	M_9	M_9	N_9	M_9	M_9	M_{10}	N_9	M_8	M_9	M_9	M_9	M_8	M_8
Date of capture	4. VII 19	5. VII 19	6. VII 19	6. VII 19	6. VII 19	6. VII 19	5.—7. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19	8. VII 19
Fishing-place	20 miles WSW of Graa Deep	20 miles SW of Graa Deep	17 miles W by S of Graa Deep	15 miles SW by S of Graa Deep	17 miles SW of Graa Deep	16 miles W by S of Graa Deep	38 miles NW of Slugen	15 miles SW of Graa Deep	37 miles SW by S of Graa Deep	18 miles SW of Graa Deep	19 miles SW of Graa Deep	20 miles SW of Graa Deep	50 miles SW of Graa Deep	45 miles SW by S of Graa Deep
Depth in m	23	21	24	22	21	21	34	21	20	34	21	21	21	21
Weight of catch in kg	300	1500	7000	1300	800	900	500	500	200	200	450	300	2500	1500
Weight of sample in kg	17.5	27	26.5	24	27	23	28	28	41	26.5	28.5	26.5	31	30.5
Length cm														
23	1	2	3	—	—	1	—	—	—		—	3	1	—
24	15	10	12	5	3	16	—	1	—	8	5	22	—	1
25	28	12	27	5	12	22	—	15	2	12	11	30	1	3
26	34	17	21	19	25	15	—	20	4	18	18	22	6	10
27	11	12	17	25	30	12	—	22	5	20	13	13	21	12
28	6	15	17	13	19	9	—	14	8	15	8	11	18	12
29	3	5	2	7	11	10	—	9	5	12	11	12	17	9
30	—	8	7	10	3	6	—	7	8	10	5	5	4	9
31	1	5	5	4	4	3	1	1	14	2	7	5	8	8
32	—	4	3	2	3	4	—	3	10	5	5	2	4	5
33	—	6	1	3	4	1	—	4	7	5	6	—	9	7
34	—	3	—	1	1	1	2	3	10	5	10	—	5	5
35	1	2	2	3	2	1	—	4	7	1	2	2	2	6
36	—	1	1	1	1	—	1	2	8	—	3	1	4	3
37	—	1	1	1	1	—	—	—	5	—	—	1	1	3
38	—	—	—	1	—	2	1	3	5	—	—	1	2	4
39	—	1	1	—	—	1	1	2	2	—	1	—	—	2
40	—	—	—	—	—	—	2	—	—	—	—	—	1	—
41	—	—	—	—	—	1	1	—	—	—	—	—	—	—
42	—	1	—	—	1	—	1	—	—	—	—	—	1	—
43	—	—	—	—	—	—	2	—	—	—	—	—	—	1
44	—	—	—	—	—	—	4	—	1	—	—	—	—	—
Total number	100	105	120	100	120	105	28 [3])	110	101	113	105	130	105	100
Average length cm *)	25.94	28.23	27.06	28.18	27.87	27.35	44.04	28.55	32.21	27.96	28.94	26.74	29.90	30.61

*) Not corrected by 0.5. — [1]) 22 cm: 1 spec.; 51 cm: 7 spec. — [2]) 45 cm: 2 spec.; 46 cm: 2 spec.; 47 cm: 1 spec.; 48 cm: 1 spec.; 49 cm: 1 spec.; 50 cm:

ments (continued).

A3												B5			Area
N_8	N_8	N_8	N_8	N_8	N_9	N_9	N_9	N_9	N_9			M_{11}	M_{11}		
17. 18. IX 19	17. - 18. IX 19	17.—18. IX 19	18. IX 19	18. IX 19	18. IX 19	29. IX 19	29. IX 19	29. IX 19	29. IX 19	Sept. 1919	Apr.—Sept. 1919	5.—7. VII 19	10. VII 19	July 1919	Date of capture
Off Hornum	Off Hornum	WNW of Hornum	NNW of Red Cliff	Off Hornum	10-12 mls. NW of Red Cliff	2 miles SW of Graa Deep	3 miles WSW of Graa Deep	4 miles SW of Graa Deep	2 miles N of Lister Deep			16 miles W by N of Lyngvig	8 miles W of Lyngvig		Fishing-place
17	18	16	17	19	16	17	15	15	12			28	24		Depth in m
800	1500	2000	500	750	850	300	200	200	150			2000	750		Weight of catch in kg
29	28	27	27	39	27	27	26	25.5	27.5			26.5	25.5		Weight of sample in kg
										Total	Total			Total	Length cm
—	1	—	—	—	—	13	—	2	—	236	888	—	1	1	23
2	1	6	—	1	3	30	5	4	2	835	3434	6	6	12	24
—	3	3	9	2	10	33	21	29	3	1625	7921	15	11	26	25
5	4	13	15	5	24	32	31	25	8	1959	11301	30	28	58	26
8	12	21	20	8	25	20	30	30	20	2060	12896	15	24	39	27
9	13	9	22	11	25	15	9	19	25	1802	11576	18	19	37	28
20	15	8	14	6	10	8	11	13	20	1492	9374	15	9	24	29
19	13	8	11	15	14	2	10	5	14	1274	7482	5	6	11	30
11	8	6	6	9	3	1	1	4	13	972	5440	4	2	6	31
9	8	11	9	9	1	1	2	—	4	739	4008	2	—	2	32
1	9	1	5	4	1	—	1	1	5	517	2812	—	1	1	33
6	3	5	2	6	1	—	—	1	1	431	2142	—	—	—	34
4	6	5	2	9	—	—	1	—	2	290	1480	—	1	1	35
3	2	2	1	5	—	—	—	—	—	227	984	—	—	—	36
3	1	—	—	4	—	—	—	—	2	166	699	—	—	—	37
—	1	1	—	3	—	—	—	—	—	132	467	—	—	—	38
—	—	—	—	2	—	—	—	—	—	110	351	—	—	—	39
—	—	—	—	6	—	—	—	—	—	77	229	—	—	—	40
—	—	1	—	1	—	—	—	—	—	45	115	—	—	—	41
—	—	—	—	—	—	—	—	—	—	26	64	—	—	—	42
—	—	—	—	—	—	—	—	—	—	17	31	—	—	—	43
—	—	—	—	—	—	—	—	—	—	6	11	—	—	—	44
—	—	—	—	1	—	—	—	—	—	7	9	—	—	—	45
—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	46
—	—	—	—	—	—	—	—	—	—	3	5	—	—	—	47
—	—	—	—	—	—	—	—	—		—	1	—	—	—	48
—	—	—	—	—	—	—	—	—	—	1	4	—	—	—	49
100	100	100	116	107	117	155	122	133	119	15050	83738[1])	110	108	218	Total number
30.21	29.99	29.15	28.62	31.93	27.55	25.75	27.01	26.89	28.95	28.67	28.54	28.10	28.05	28.07	Average length cm

B4														Area
M_9	M_8	M_8	M_9	M_8	M_9	M_9	M_8	M_8	M_8	M_9	M_8	M_8	M_8	
8.—9. VII 19	8.—9. VII 19	8.—10. VII 19	9. VII 19	9. VII 19	9.—10. VII 19	9.—10. VII 19	12. VII 19	12.—13. VII 19	16.—17. VII 19	16.—17. VII 19	17. VII 19	17. VII 19	17. VII 19	Date of capture
20 miles WSW of Graa Deep	40 miles SW of Graa Deep	43 miles SW by S of Graa Deep	20 miles SW of Graa Deep	35 miles SW of Graa Deep	20 miles SW by W of Graa Deep	18 miles WSW of Graa Deep	48 miles SW by S of Graa Deep	45 miles SW of Graa Deep	36 miles SW of Graa Deep	25 miles SW by S of Graa Deep	20 miles W of Hornum	35 miles SW by S of Graa Deep	35 miles SW by S of Graa Deep	Fishing-place
23	22	21	20	20	20	21	21	23	21	22	21	21	22	Depth in m
1000	2000	2000	1100	1000	500	500	1500	1250	500	2000	700	1500	500	Weight of catch in kg
26	34	30	26.5	23	26.5	26	46.5	40.5	28.5	29	33.5	26	28.5	Weight of sample in kg
														Length cm
—	1	—	1	—	—	1	—	—	—	—	—	—	—	23
—	3	—	5	10	3	8	1	—	2	2	2	3	—	24
8	2	8	26	11	11	22	1	1	4	3	3	18	3	25
28	8	12	24	11	16	23	1	2	9	13	9	22	9	26
25	13	21	14	21	18	24	3	2	17	14	19	27	15	27
12	9	9	15	13	11	16	1	5	25	15	17	13	15	28
9	7	7	8	12	15	9	11	6	20	5	9	14	13	29
5	3	9	5	9	6	9	6	7	6	15	8	6	6	30
8	12	4	5	4	6	5	9	9	8	10	7	6	8	31
2	8	8	2	3	6	3	11	7	—	6	5	3	11	32
5	9	5	—	2	6	1	12	15	2	2	7	2	5	33
3	7	3	4	1	1	1	16	6	3	2	8	2	9	34
2	4	2	2	1	2	—	9	5	3	3	2	1	1	35
1	5	2	1	—	1	—	8	9	3	3	1	—	3	36
1	5	2	1	1	2	—	9	10	1	6	3	1	—	37
1	—	4	—	—	1	—	4	7	—	1	2	—	1	38
—	—	—	—	—	1	—	6	3	1	—	3	—	1	39
—	—	2	—	1	—	—	2	3	—	—	1	—	—	40
—	—	1	—	—	—	—	—	—	—	—		—	—	41
—	3	1	—	—		—	—	3	1	—	1	—	—	42
—	1	—	—	—	—	—	—	—	—	—	1	—	—	43
—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
100	100	100	113	100	106	122	110	100	105	100	108	118	100	Total number
28.27	30.86	29.82	27.39	27.82	28.67	27.11	33.24	33.55	29.03	29.63	30.20	27.64	29.82	Average length cm

1 spec.; 55 cm: 4 spec.

Table of Measure

Area	B_4											
	M_8	M_8	M_8	N_9	M_9	M_8	M_8	M_8	M_8	M_9	M_8	M_8
Date of capture	17.—18. VII 19	17.—18. VII 19	19.—20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19	20. VII 19
Fishing-place	42 miles W of Hornum	37 miles SW of Graa Deep	45 miles SW by S of Graa Deep	18 miles SW by S of Graa Deep	25 miles SW by S of Graa Deep	40 miles SW of Graa Deep	40 miles SW by S of Graa Deep	45 miles SW of Graa Deep	42 miles SW by S of Graa Deep	30 miles SW of Graa Deep	35 miles SW by S of Graa Deep	42 miles SW of Graa Deep
Depth in m	20	21	21	21	23	21	23	23	21	21	20	21
Weight of catch in kg	3000	2000	1500	450	7000	1400	1000	1500	500	—	800	1500
Weight of sample in kg	26.5	28.5	27.5	27.5	29	21	28	41	27.5	24	28	28
Length cm												
23	1	2	—	—	—	—	—	—	3	—	—	1
24	12	3	5	3	—	3	5	—	5	2	—	15
25	20	8	23	11	—	25	26	4	6	13	6	33
26	16	20	39	15	7	25	23	10	15	28	8	26
27	21	28	25	17	17	20	28	8	21	23	15	21
28	16	15	16	10	25	13	11	18	18	15	23	19
29	3	15	4	7	15	9	13	10	13	9	11	9
30	4	7	7	8	10	7	4	12	12	10	10	6
31	7	8	5	3	11	—	—	13	5	4	9	2
32	1	6	—	5	3	—	3	12	1	4	5	3
33	4	1	—	7	7	1	2	8	2	1	2	1
34	2	1	—	3	1	1	2	8	2	—	4	1
35	2	1	—	3	5	—	—	4	1	—	1	2
36	—	3	2	2	2	—	1	5	2	—	—	—
37	—	—	1	1	1	—	2	3	—	1	1	—
38	—	—	—	4	1	1	3	4	6	—	1	—
39	1	1	—	1	—	—	1	1	—	—	1	1
40	—	—	—	—	—	—	—	1	—	—	2	—
41	—	—	—	—	—	—	—	—	1	—	—	—
42	—	1	—	—	—	—	—	1	—	—	1	—
43	—	—	—	—	—	—	—	—	—	—	—	—
44	—	—	—	—	—	—	—	1	—	—	—	—
Total number	110	120	127	100	105	105	124	123	113	110	100	140
Average length cm *)	27.34	28.25	26.94	29.10	29.52	26.82	27.60	30.90	28.62	27.50	29.38	26.84

Area	B_4										
	M_{10}—N_9	M_8	M_{10}—N_9	M_8	M_8	N_8	M_8	M_{10}	M_{10}	M_8	M_8
Date of capture	24. VII 19	24.—25. VII 19	25. VII 19	26. VII 19	25.—26. VII 19	26.—27. VII 19	27.—28. VII 19	27.—28. VII 19	28. VII 19	28.—29. VII 19	28.—29. VII 19
Fishing-place	Slugen	40 miles SW of Graa Deep	Slugen	40 miles SW of Graa Deep	40 miles SW of Graa Deep	42 miles SSW of Graa Deep	38 miles SW of Graa Deep	Slugen N	Slugen N	35 miles SW of Graa Deep	37 miles SW by S of Graa Deep
Depth in m	26	24	26	23	21	22	21	24	21	21	23
Weight of catch in kg	600	1000	1500	700	1000	800	500	1500	600	1300	800
Weight of sample in kg	27	26	27.5	28.5	27	29	29	40	28	33.5	27.5
Length cm											
23		—	—	2	3	—	3	—	—	—	—
24	—	1	3	8	6	—	10	—	4	1	2
25	2	6	13	14	25	4	22	1	13	—	12
26	15	25	12	17	23	10	25	2	16	—	20
27	16	21	14	24	20	16	12	12	22	4	21
28	28	25	17	17	9	17	16	19	17	7	20
29	19	13	10	7	7	17	6	17	3	14	12
30	8	7	13	6	6	14	5	12	9	18	7
31	9	4	4	4	4	12	10	15	10	13	2
32	4	1	5	4	5	8	7	16	7	10	5
33	2	3	1	6	4	4	—	10	3	10	3
34	2	3	5	1	1	3	5	8	—	11	5
35	—	1	2	1	1	1	1	1	3	3	—
36	—	—	1	—	—	—	—	2	—	2	1
37	1	—	—	3	2	—	1	1	—	3	—
38	—	—	—	2	—	1	—	2	—	—	2
39	—	—	—	1	—	—	—	—	—	—	—
40	1	—	—	—	1	1	—	—	—	3	1
41	—	—	—	—	1	—	—	—	—	—	—
42	—	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	—	—	—	—	—	—	—
44	1	—	—	—	—	—	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—
46	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—
48	—	—	—	—	—	—	—	—	—	—	—
49	—	—			—	—	—	—	—	—	—
50	—	—	—		—	—	—	—	—	—	—
52	—	—	—	—	—	—	—	—	—	—	—
55		—	—	—	—	—	—	—	—	—	—
Total number	108	110	100	117	118	108	123	118	107	99	113
Average length cm *)	28.79	27.91	28.36	28.05	27.55	29.22	27.49	30.38	28.06	31.40	28.28

*) Not corrected by 0.5. — [1]) 48 cm: 1 spec. — [2]) 46 cm: 2 spec.; 47 cm: 2 spec.; 48 cm: 6 spec.; 50 cm: 4 spec.; 52 cm: 2 spec.

ments (continued).

B4												Area
M_8	M_8	M_8	M_8	M_{10}—N_9	M_8	M_8	M_8	M_8	M_8	M_8	L_8	
20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	20.—21. VII 19	21.—22. VII 19	21.—22. VII 19	21.—22. VII 19	22.—23. VII 19	Date of capture
50 miles SW of Graa Deep	40 miles SW by S of Graa Deep	42 miles SW by S of Graa Deep	45 miles SW by S of Graa Deep	Slugen	40 miles SW by S of Graa Deep	45 miles SW by S of Graa Deep	40 miles SW of Graa Deep	40 miles SW of Graa Deep	40 miles SW of Graa Deep	40 miles SW of Graa Deep	70 miles WSW of Graa Deep	Fishing-place
21	22	20	21	23	21	23	22	21	21	23	38	Depth in m
500	900	1200	1000	1500	300	700	1000	1000	1000	800	300	Weight of catch in kg
28	42.5	27.5	31	29	27	28	28	27	25	28	50	Weight of sample in kg
												Length cm
—	—	1	—	2	—	—	—	—	2	—	—	23
—	1	4	5	1	4	—	1	3	9	—	—	24
4	4	11	18	10	4	—	4	10	20	11	—	25
16	8	13	35	20	15	10	12	25	38	3	—	26
20	17	22	26	22	25	10	20	20	25	20	2	27
9	17	20	25	13	21	19	25	21	10	25	—	28
6	12	10	15	22	9	17	14	13	4	12	2	29
9	18	10	10	8	10	15	8	11	5	13	2	30
11	7	6	4	8	7	7	6	3	5	7	2	31
10	6	6	1	3	7	11	5	4	1	4	2	32
—	12	3	—	3	2	4	3	2	1	2	2	33
3	5	1	1	2	1	2	3	1	—	—	4	34
2	5	3	1	—	2	1	1	2	—	3	14	35
3	5	1	—	—	—	1	1	1	1	3	12	36
2	6	1	—	—	1	—	—	—	—	1	8	37
1	2	—	—	—	—	—	1	1	—	—	4	38
—	1	1	—	—	—	2	2	—	—	—	—	39
—	1	—	—	—	—	—	2	—	1	—	—	40
2	2	—	—	—	—	—	—	—	—	—	—	41
1	1	—	—	—	—	1	—	—	—	2	2	42
1	—	—	—	—	—	—	—	—	—	—	4	43
—	—	—	—	—	—	—	—	—	—	—	2	44
100	131 [1])	113	141	114	108	100	108	117	122	106	78 [2])	Total number
29.72	30.79	28.35	27.25	27.95	28.31	29.65	29.04	27.97	26.78	29.02	38.36	Average length cm

B4										Area
M_8	M_{10}	M_{10}	M_8	M_{10}	M_{10}	M_8	M_8	M_9		
28.—29. VII 19	28.—29. VII 19	28.—29. VII 19	28.—29. VII 19	29. VII 19	29. VII 19	29.—30. VII 19	29.—30. VII 19	29.—30. VII 19	July 1919	Date of capture
43 miles SW of Graa Deep	Slugen N	Slugen N	36 miles SW by S of Graa Deep	Slugen N	Slugen N	40 miles SW of Graa Deep	38 miles SW of Graa Deep	20 miles W of Vyl Light-Ship		Fishing-place
23	23	22	36	23	23	24	20	24		Depth in m
1000	400	1100	900	1500	600	800	800	1400		Weight of catch in kg
29	26.5	30.5	32.5	26.5	24.5	29.5	27.5	27.5		Weight of sample in kg
									Total	Length cm
—	—	—	—	5	19	—	—	—	58	23
2	1	2	—	10	24	2	—	—	294	24
11	3	7	4	20	20	2	11	—	762	25
15	10	15	4	18	20	8	18	7	1123	26
21	17	12	10	26	14	9	24	15	1249	27
16	18	10	13	16	5	10	19	19	1063	28
10	16	15	11	8	8	12	12	18	747	29
7	7	6	9	4	2	13	7	10	568	30
5	3	8	9	3	5	10	5	5	449	31
3	7	10	10	2	—	7	4	9	352	32
3	2	5	5	2	—	6	5	5	275	33
6	4	1	8	—	—	5	2	6	236	34
—	—	3	4	—	—	1	1	1	149	35
7	3	4	2	—	—	5	—	2	137	36
—	1	—	3	—	—	1	—	3	104	37
2	—	—	2	—	—	2	1	—	83	38
2	—	2	4	—	—	—	1	—	49	39
—	—	—	—	—	—	1	—	—	27	40
—	—	—	—	—	—	1	—	—	10	41
—	—	—	—	—	—	—	2	—	25	42
—	—	—	—	—	—	—	—	—	10	43
—	—	—	—	—	—	—		—	9	44
—	—	—	—	—	—	—	—	—	2	45
—	—	—	—	—	—	—	—	—	4	46
—	—	—	—	—	—	—	—	—	3	47
—	—	—	—	—	—	—	—	—	8	48
—	—	—	—	—	—	—	—	—	1	49
—	—	—	—	—	—	—	—	—	5	50
—	—	—	—	—	—	—	—	—	2	52
—	—	—	—	—	—	—	—	—	4	53
110	92	100	98	114	117	95	112	100	7808	Total number
28.93	28.91	29.26	30.80	26.74	25.62	30.29	28.51	29.71	28.81	Average length cm

Table of Measure-

Area	B_4													
	M_8	M_{10}	M_{10}	M_{10}	M_{10}	M_{10}	M_{10}	M_{10}	M_9	M_8	M_{10}	M_{10}	N_9	N_9
Date of capture	5.—6. VIII 19	6. VIII 19	6. VIII 19	6. VIII 19	6. VIII 19	6. VIII 19	6. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19	10. VIII 19
Fishing-place	45 miles SW of Graa Deep	Slugen N	Slugen N	Slugen N	Slugen N	Slugen N	Slugen N	Slugen N	18 miles SW of Graa Deep	42 miles SW of Graa Deep	Slugen N	Slugen N	At Red Cliff Sand	20 miles SW by S of Graa Deep
Depth in m	34	20	21	24	24	23	23	22	28	24	21	21	21	21
Weight of catch in kg	1400	800	700	400	500	600	300	1400	800	1200	1000	1500	300	700
Weight of sample in kg	40	26	30	26.5	29	32.5	28.5	39	26	23.5	27.5	26.5	27	27
Length cm														
23	1	7	3	22	—	—	6	—	—	16	8	—	—	—
24	2	10	15	25	5	—	8	—	1	23	33	—	11	1
25	2	12	11	22	5	1	10	8	10	37	38	—	12	7
26	5	17	14	20	20	2	12	10	18	24	23	3	15	27
27	20	21	18	11	16	10	19	18	32	22	7	10	17	20
28	20	14	10	11	15	11	10	10	15	7	10	11	16	10
29	25	4	6	10	15	20	13	14	13	3	6	13	18	7
30	10	10	8	2	11	16	5	10	5	—	3	17	8	4
31	5	3	11	2	4	14	9	14	6	2	3	12	8	2
32	3	6	5	4	4	7	2	12	6	—	3	7	8	1
33	9	1	5	1	—	7	3	7	3	—	—	4	1	2
34	7	2	2	1	2	4	—	7	2	—	—	4	2	2
35	3	1	2	—	1	4	2	5	—	—	—	—	1	1
36	4	—	—	—	1	1	1	5	1	—	—	2	—	6
37	5	—	2	—	1	2	—	—	—	—	—	—	—	2
38	3	—	—	—	—	1	—	—	—	1	—	1	—	4
39	2	—	—	—	—	—	—	—	—	—	—	3	—	4
40	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41	1	—	—	—	—	—	—	—	—	—	—	—	—	—
42	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	128	108	112	131	100	100	100	120	112	135	134	87	117	100
Average length cm *)	30.24	27.21	27.91	25.86	28.10	30.28	27.60	29.78	27.98	25.53	25.72	30.28	27.89	29.05

Area	B_4													
	M_8	M_8	M_9	M_{10}	M_{10}	M_{10}	M_{10}	M_9	M_8	M_9	M_{10}	M_{10}	M_9	M_{10}
Date of capture	14. VIII 19	13.—14. VIII 19	14. VIII 19	14. VIII 19	14. VIII 19	14. VIII 19	15. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19	16.—17. VIII 19
Fishing-place	45 miles SW of Graa Deep	46 miles SW of Graa Deep	20 miles SW of Graa Deep	Slugen N	Slugen N	Slugen N	Slugen N	20 miles W by S of Graa Deep	40 miles SW of Graa Deep	25 miles SW of Graa Deep	Slugen N	Slugen N	10 miles W by N of Graa Deep	Slugen N
Depth in m	23	24	21	21	21	24	21	21	25	21	21	23	24	21
Weight of catch in kg	400	1200	500	700	400	1080	400	1000	500	1000	1000	750	650	2000
Weight of sample in kg	27.5	24	28	28	28	30.5	28.5	28.5	28	21	29	27.5	27	27
Length cm														
23	2	—	—	1	—	2	—	2	5	—	1	6	1	—
24	3	—	9	9	—	5	3	5	7	3	3	10	2	—
25	15	1	11	21	4	15	5	15	8	5	18	14	7	9
26	35	7	14	30	15	29	12	12	19	12	11	17	7	17
27	30	12	6	30	10	18	14	15	31	18	11	10	13	15
28	22	23	17	31	15	12	17	18	26	14	4	17	15	12
29	14	20	10	11	17	8	16	21	21	7	15	12	9	8
30	6	17	9	2	12	12	11	10	3	6	4	6	15	9
31	2	12	4	3	11	4	6	10	5	6	5	9	10	6
32	1	11	3	1	5	4	4	7	3	10	4	4	10	4
33	—	6	6	—	3	6	4	2	2	5	6	2	5	3
34	1	2	6	1	2	2	1	2	1	10	8	2	2	4
35	—	1	2	—	5	3	4	1	—	3	5	2	2	4
36	—	1	4	—	1	—	2	—	—	2	3	2	—	3
37	—	1	1	—	—	—	2	—	—	3	1	—	1	5
38	1	1	2	—	—	—	1	—	—	2	—	2	—	1
39	—	—	1	—	—	—	—	—	—	1	—	1	—	—
40	—	—	—	—	—	1	—	—	—	1	1	—	1	—
41	—	1	—	—	—	—	—	—	—	4	—	—	—	—
Total number	132	116	105	140	100	121	102	120	131	112	100	116	100	100
Average length cm *)	27.13	29.67	28.96	26.86	29.12	27.87	28.03	28.12	27.42	30.25	29.08	27.95	29.20	29.30

*) Not corrected by 0.5.

ments (continued).

B_4														Area
M_{10}	N_9	M_9	M_8	M_{10}	M_{10}	M_8	M_8	M_8	M_{10}	M_{10}	N_{10}	M_9	M_8	
10. VIII 19	10. VIII 19	10. VIII 19	10.—11. VIII 19	11. VIII 19	11. VIII 19	10.—12. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	13. VIII 19	14. VIII 19	14. VIII 19	Date of capture
Slugen N	10 miles WSW of Graa Deep	30 miles SW of Graa Deep	40 miles SW of Graa Deep	Slugen N	Slugen N	50 miles SSW of Graa Deep	40 miles SW of Graa Deep	44 miles SW of Graa Deep	Slugen N	Slugen N	11 miles NNW of Graa Deep	16 miles W of Graa Deep	42 miles SW of Graa Deep	Fishing-place
23	24	21	22	25	23	21	24	23	23	23	20	24	21	Depth in m
400	600	350	2000	200	400	1000	1000	2200	500	700	900	300	400	Weight of catch in kg
26	27	31	26.5	28.5	29.5	29	28	—	29	22.5	34	26	26.5	Weight of sample in kg
														Length cm
3	—	—	—	2	—	—	—	—	6	30	1	—	2	23
10	—	1	1	4	—	1	—	1	19	31	—	5	1	24
31	6	7	6	8	2	10	9	1	28	25	3	11	8	25
23	7	8	10	7	6	10	11	4	20	11	3	18	18	26
18	18	11	21	10	9	3	23	10	15	11	10	23	21	27
13	23	11	8	13	16	8	23	18	11	8	12	17	21	28
9	16	14	15	11	17	10	14	7	10	4	11	16	13	29
7	12	12	12	15	13	15	10	5	7	2	23	16	11	30
3	8	5	7	5	7	12	7	13	3	—	10	2	9	31
1	8	3	4	9	6	6	3	13	6	1	12	4	7	32
1	6	11	6	6	7	7	9	10	2	2	8	—	2	33
—	—	4	2	6	5	8	3	1	—	—	8	2	4	34
—	—	4	4	2	4	2	—	6	—	—	6	1	—	35
1	1	1	1	—	2	3	1	3	—	—	1	—	—	36
—	—	3	2	1	1	3	—	3	—	—	1	—	—	37
—	—	2	—	—	2	1	1	1	—	—	1	—	—	38
—	—	3	—	1	3	1	—	—	1	—	1	—	—	39
—	—	—	—	—	—	—	—	2	—	—	—	—	—	40
—	—	—	1	—	—	—	—	2	—	—	—	—	—	41
—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
120	105	100	100	100	100	100	114	100	128	125	111	115	117	Total number
26.64	28.80	30.08	29.22	29.18	30.32	30.12	28.67	30.92	26.70	25.12	30.46	27.30	28.25	Average length cm

B_4														Area
M_{10}	M_9	M_9	M_{10}	M_8	M_9	M_8	M_{10}	N_9	M_{10}	M_9	M_9	M_9	M_9	
16.—17. VIII 19	17. VIII 19	17. VIII 19	17.—18. VIII 19	17.—18. VIII 19	17.—18. VIII 19	17.—18. VIII 19	19. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	19.—20. VIII 19	Date of capture
Slugen N	15 miles WSW of Graa Deep	16 miles W by S of Graa Deep	Slugen N	40 miles SW of Graa Deep	11 miles W by S of Graa Deep	40 miles SW of Graa Deep	Slugen N	16 miles SW by S of Graa Deep	Slugen N	17 miles WSW of Graa Deep	18 miles SW of Graa Deep	20 miles SW of Graa Deep	17 miles WSW of Graa Deep	Fishing-place
23	21	21	23	22	21	21	24	20	23	23	21	21	23	Depth in m
800	700	800	800	500	300	1500	500	—	1500	1000	750	1000	500	Weight of catch in kg
30.5	28	28.5	26	27.5	27	27	25.5	28	26.5	29	28	25	27	Weight of sample in kg
														Length cm
2	—	—	5	1	—	—	2	—	8	—	4	11	2	23
1	7	2	14	5	3	5	10	5	20	1	6	13	1	24
7	26	7	32	8	11	14	20	12	12	6	20	12	3	25
8	20	17	30	27	13	20	19	15	22	11	21	14	6	26
12	40	12	16	15	13	22	15	17	15	17	18	22	13	27
11	15	20	12	16	17	15	12	21	9	13	10	10	14	28
12	10	22	11	11	13	18	8	13	6	19	15	10	22	29
10	5	14	6	6	13	10	7	10	10	8	15	6	13	30
10	3	8	1	7	13	5	3	8	5	8	3	5	12	31
8	3	3	1	—	8	—	2	2	3	8	3	3	6	32
6	2	2	—	4	1	—	3	1	3	5	4	7	4	33
5	1	3	—	2	1	2	1	3	2	7	2	2	1	34
4	1	1	—	2	1	—	3	3	—	—	1	—	1	35
1	—	1	—	—	1	1	—	3	—	2	1	—	3	36
—	—	—	—	3	2	—	—	1	—	—	1	—	—	37
—	—	—	—	1	—	2	—	1	—	—	1	—	—	38
—	—	—	—	—	—	—	—	—	—	1	—	—	—	39
—	—	1	—	—	—	—	—	—	—	1	—	—	1	40
—	—	—	—	1	—	—	—	—	—	—	—	—	—	41
97	133	113	128	109	110	114	105	115	115	107	125	115	102	Total number
29.31	27.08	28.58	26.26	28.20	28.64	27.73	27.22	28.43	26.83	29.27	27.74	27.16	29.26	Average length cm

Table of Measure-

Area	B_4												B_4	
	M_9	M_9	M_9	M_{10}	M_9	M_9	M_9	N_9	M_{10}	M_{10}	M_{10}		M_{10}	M_{10}
Date of capture	20.—21. VIII 19	20.—21. VIII 19	21. VIII 19	21. VIII 19	21. VIII 19	21. VIII 19	21.—22. VIII 19	21.—22. VIII 19	26. VIII 19	26. VIII 19	27. VIII 19	Aug. 1919	1. IX 19	1. IX 19
Fishing-place	NNW of Vyl Light Vessel	20 miles SW of Graa Deep	5 miles W by N of Graa Deep Light Vessel	Slugen N	23 miles SW ½ W of Graa Deep	16 miles SW of Graa Deep	30 miles SW of Graa Deep	15 miles SW of Graa Deep	Slugen N	Slugen N	Slugen N		Slugen N	Slugen N
Depth in m	21	20	21	23	24	20	20	21	21	23	23		21	21
Weight of catch in kg	900	400	600	500	400	600	500	1000	700	500	1000		1400	500
Weight of sample in kg	22	31	29.5	27.5	25	26	26.5	27	29.5	28	27		28	26.5
Length cm												Total		
23	—	—	—	10	8	7	—	1	8	3	1	200	7	7
24	9	5	4	16	13	9	2	9	15	13	6	461	12	17
25	33	18	15	32	15	29	5	25	32	30	30	932	10	34
26	23	20	10	15	20	20	20	17	28	19	19	1057	25	27
27	14	16	8	20	11	20	25	23	13	21	15	1110	11	14
28	16	24	17	12	16	12	19	10	16	11	15	978	15	14
29	14	16	13	7	15	12	12	8	6	9	6	831	11	9
30	4	7	21	6	5	5	15	7	7	3	6	610	3	8
31	2	9	8	2	4	5	7	5	6	4	8	430	4	2
32	2	4	12	5	1	3	5	4	2	4	2	316	7	2
33	—	4	4	—	2	2	2	3	—	—	2	231	5	—
34	—	—	4	—	1	1	—	4	1	2	—	167	1	—
35	—	2	2	—	1	2	1	2	1	1	1	111	1	—
36	—	—	1	—	—	—	—	—	—	—	1	68	—	—
37	—	3	—	—	—	—	1	2	—	—	—	53	1	—
38	—	—	1	—	—	—	—	—	—	—	1	35	1	—
39	—	1	—	1	1	—	1	—	—	—	—	27	—	—
40	—	—	—	—	—	—	—	—	—	—	—	9	—	—
41	—	1	—	—	—	—	—	—	—	—	—	11	—	—
42	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Total number	117	130	120	126	113	127	115	120	135	120	113	7638	114	134
Average length cm *)	26.64	28.22	28.95	26.38	27.00	26.91	28.28	27.59	26.47	26.72	27.23	28.08	27.47	26.25

Area	B_4													
	M_9	M_{10}	M_{10}	N_9	M_{10}	M_{10}	M_9	N_8	M_{10}	M_9	M_{10}	M_8	M_{10}	M_{10}
Date of capture	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	6.—7. IX 19	7. IX 19	7. IX 19	8.—9. IX 19	9. IX 19	9. IX 19	9. IX 19	9. IX 19	9.-10.-11. IX 19	10. IX 19	10. IX 19
Fishing-place	20 miles SW of Graa Deep	18 miles NW of Graa Deep Buoy	Slugen N	15 miles SW by S of Graa Deep	Slugen N	Slugen N	36 miles NW of Hornum	Off Amrum	Slugen N	20 miles SW of Graa Deep	Slugen N	40 miles SW of Graa Deep	Slugen N	Slugen N
Depth in m	23	21	20	21	20	23	20	23	21	21	20	23	21	21
Weight of catch in kg	500	800	650	700	400	600	500	500	1200	250	600	400	750	400
Weight of sample in kg	27.5	27	27.5	27	27	27	27	28	33	29	27.5	28	28	27.5
Length cm														
23	—	5	3	—	2	6	—	1	—	—	4	1	10	—
24	5	20	8	3	2	8	6	1	3	—	7	7	4	5
25	20	15	11	8	6	12	8	1	4	5	17	18	13	14
26	18	7	13	15	13	13	23	6	11	21	20	17	14	15
27	14	17	13	15	17	11	20	14	17	18	17	32	11	19
28	21	8	11	20	12	13	22	35	12	20	13	25	10	16
29	11	5	4	12	14	6	10	24	14	15	10	16	8	14
30	8	5	13	8	10	7	10	12	9	11	7	9	12	5
31	10	5	8	12	10	7	5	11	11	9	3	5	5	6
32	5	5	6	2	5	8	5	5	7	3	5	3	10	10
33	3	6	5	2	3	4	1	2	8	5	2	1	2	1
34	1	5	4	5	5	4	5	—	5	4	2	—	4	3
35	1	—	2	—	1	—	3	1	1	—	—	—	2	1
36	1	1	1	2	—	3	1	—	2	—	1	—	1	—
37	—	1	1	—	3	—	1	—	1	—	2	—	1	1
38	1	—	—	—	1	1	—	—	—	1	—	—	1	—
39	—	1	1	2	—	1	—	—	—	—	—	—	1	—
40	—	—	1	—	—	—	—	—	—	—	—	—	—	—
41	—	—	—	—	—	—	—	—	—	—	—	—	—	—
42	1	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	1	—	—	—	—	—	—	—	—	—	1	—
Total number	120	106	106	106	104	104	120	113	105	112	110	134	110	110
Average length cm *)	28.06	27.59	28.73	28.65	28.90	28.26	28.20	28.71	29.26	28.54	27.50	27.35	28.40	28.09

*) Not corrected by 0.5. — [1]) 44 cm: 9 spec.; 45 cm: 3 spec.; 46 cm: 4 spec.; 47 cm: 5 spec.; 48 cm: 11 spec.; 49 cm: 3 spec.; 50 cm: 7 spec.; 51 cm:

ments (continued).

B4													Area
N_9	M_9	M_{10}	M_{10}	M_9	M_9	N_9	M_{10}	M_{10}	M_{10}	M_{10}	N_9	M_9	M_8	
1.—2.—3. IX 19	2. IX 19	2. IX 19	2.–3. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	3.—4. IX 19	4. IX 19	4. IX 19	5.—6. IX 19	6.—7. IX 19	6.—7. IX 19	Date of capture
12 miles SSW of Graa Deep	16 miles SW of Graa Deep	Slugen N	Slugen N	18 miles SW of Graa Deep	SW of Vyl Light-Vessel	11 miles SSW of Graa Deep	Slugen N	Slugen N	Slugen N	Slugen N	6 miles W of Lister-Deep	25 miles W by S of Graa Deep	40 miles SW of Graa Deep	Fishing-place
21	20	23	23	21	26	20	21	23	21	23	20	24	23	Depth in m
600	1200	800	1000	900	1000	550	700	750	1300	700	1500	1000	1000	Weight of catch in kg
28.5	26.5	27.5	26.5	27.5	31	28	26	27.5	28	29	30.5	28	23	Weight of sample in kg
														Length cm
1	2	—	8	—	1	1	5	1	4	1	—	—	—	23
2	10	5	21	1	—	20	31	3	3	3	1	1	2	24
2	26	13	25	4	4	31	33	10	15	7	3	10	32	25
4	29	15	15	11	10	30	26	12	22	13	7	14	33	26
5	23	16	15	15	10	19	13	9	20	16	16	13	31	27
8	16	7	11	14	13	18	9	15	11	21	7	20	9	28
9	10	14	10	20	20	10	4	15	6	23	11	15	8	29
9	5	11	7	9	13	4	3	16	12	20	10	10	3	30
7	6	7	3	9	12	3	4	7	7	7	9	10	2	31
3	2	6	2	6	16	3	2	5	1	4	9	8	—	32
2	1	2	2	3	7	—	1	3	3	5	3	4	—	33
10	—	1	—	4	4	—	—	2	5	1	9	4	—	34
7	—	1	—	4	2	—	—	1	1	—	6	3	—	35
2	—	1	—	5	—	—	—	2	2	—	2	—	—	36
1	—	1	—	1	—	1	—	—	—	—	2	—	—	37
2	—	—	—	—	—	—	—	—	—	—	3	—	—	38
5	—	—	1	—	2	—	—	1	—	—	1	—		39
1	—	—	—	—	—	—	—	—	—	—	—	—	—	40
—	—	—	—	—	—	—	—	—	—	—	—	—	—	41
1	—	—	—	—	—	—	—	1	—	—	1	—	—	42
81	130	100	120	106	114	140	131	103	112	121	100	112	120	Total number
31.37	26.78	28.16	26.48	29.43	29.70	26.51	25.88	28.81	27.84	28.42	30.51	28.78	26.49	Average length cm

B4														Area
M_8	M_{10}	M_9	M_{10}	M_9	M_9	M_{10}	N_8	M_{10}	M_9	M_9	M_9			
9.-10.-11. IX 19	10.—11. IX 19	12.—13. IX 19	12.-13.-14. IX 19	12.-13.-14. IX 19	13.—14. IX 19	14. IX 19	15.—16. IX 19	16. IX 19	16.-17.-18. IX 19	17. IX 19	17.—18. IX 19	Sept. 1919	May—Sept. 1919	Date of capture
45 miles SW of Graa Deep	Slugen N	5 miles NW of Vyl	Slugen N	20 miles W by N of Graa Deep	20 miles NW of Red Cliff	Slugen N	10 miles W of Red Cliff Light	Slugen N	20 miles SW of Graa Deep	16 miles W of Graa Deep	17—18 miles W of Graa Deep			Fishing-place
24	23	23	23	24	20	21	22	21	21	21	23			Depth in m
650	500	300	600	500	1500	750	900	350	200	750	300			Weight of catch in kg
27.5	29	27.5	27	28	28.5	26	31	35	28	27.5	27			Weight of sample in kg
												Total	Total	Length cm
—	1	1	—	—	13	1	—	—	—	—	—	86	351	23
2	5	3	9	2	19	7	—	—	17	—	5	280	1071	24
8	7	11	21	3	33	8	2	6	20	6	14	550	2336	25
13	11	13	11	11	26	18	2	6	32	10	21	673	3024	26
23	16	19	11	11	21	18	10	11	24	13	22	680	3243	27
24	14	23	7	16	15	11	16	9	15	16	19	631	2833	28
11	10	12	15	13	6	12	13	9	4	9	20	492	2221	29
7	9	12	7	19	10	9	20	7	13	20	9	411	1709	30
4	8	10	10	14	1	4	12	11	5	6	4	295	1284	31
2	8	9	6	6	—	7	4	6	4	8	5	220	955	32
4	5	—	7	5	—	8	7	12	2	2	3	141	701	33
3	3	1	5	2	1	2	7	8	2	3	—	125	572	34
2	2	—	2	1	—	—	1	6	—	—	—	52	355	35
1	1	—	1	—	—	1	1	1	—	3	—	36	260	36
1	—	—	—	1	—	1	3	3	—	2	1	30	203	37
1	—	—	—	1	—	—	—	5	1	—	—	19	157	38
	—	—	—	—	—	—	1	—	—	2		19	103	39
1	—	—	—	—	—	—	1	—	1	—		5	48	40
—	—	—	—	—	—	—	—	—	—	—	—	—	23	41
—	—	—	—	—	—	1	—	—	—	—	—	5	34	42
1	—	—	—	—	—	—	—	—	—	—	—	3	13	43
108	100	114	112	105	145	108	100	100	140	100	123	4753	21550 [1]	Total number
28.65	28.65	28.11	28.34	29.24	26.08	28.39	30.27	30.74	27.21	29.40	27.74	28.17	28.45	Average length cm

1 spec.; 52 cm: 3 spec.; 55 cm: 6 spec.; 56 cm: 1 spec.; 60 cm: 1 spec.

Table of Measure-

Area	B_1?	C_2												
		L_8	M_7	L_8	M_7	M_{11}	L_9	L_9	L_9	L_8	M_9	L_9	L_8	M_7
Date of capture	13.—15. IX 19	7.—8. VII 19	7.—8. VII 19	8.—9. VII 19	8.—9. VII 19	11.—12. VII 19	12.—13. VII 19	16.—17. VII 19	16.—17. VII 19	16.—17. VII 19	17.—18. VII 19	17.—18. VII 19	19.—20. VII 19	21.—22. VII 19
Fishing-place	Dogger Bank	65 miles WSW of Graa Deep	80 miles SW by S of Graa Deep	73 miles W by S of Graa Deep	70 miles SSW of Graa Deep	60 miles NW by N of Slugen	70 miles W of Graa Deep Bay	47 miles W by S of Graa Deep	80 miles W ½ S of Graa Deep	70 miles W by S of Graa Deep	28 miles W of Graa Deep	70 miles W of Graa Deep	84 miles W by S of Graa Deep	75 miles SW by S of Graa Deep
Depth in m	38	41	47	41	41	32	51	45	47	43	45	41	49	43
Weight of catch in kg.	2000	300	100[1]	300	200	400	200	400	300	500	1000	250	120	400
Weight of sample in kg.	56	31	64	60	28	50	47	48	52	48.5	42	32	52	66
Length cm														
25	—	—	—	—	—	—	—	—	2	—	—	1	—	—
26	—	—	—	—	—	—	—	—	2	—	—	5	—	—
27	—	—	—	—	—	—	—	2	—	—	—	18	2	—
28	—	4	—	—	1	—	—	—	2	—	2	10	2	—
29	4	2	2	—	1	4	—	4	2	1	1	15	2	—
30	5	1	—	—	2	4	—	4	8	3	7	10	2	4
31	3	4	4	—	—	4	2	8	2	2	1	6	6	—
32	2	3	4	—	5	5	—	4	4	1	7	7	4	12
33	3	—	6	—	8	4	4	8	8	4	12	5	2	4
34	7	3	—	—	4	2	2	4	8	4	7	5	12	14
35	5	2	6	—	2	4	4	6	10	6	8	5	4	2
36	13	1	4	—	2	12	2	10	10	3	5	2	2	12
37	11	—	10	—	2	4	2	2	4	4	3	5	2	10
38	9	1	6	—	1	8	4	4	8	3	5	3	2	—
39	3	1	2	—	1	8	—	2	2	2	1	—	4	2
40	9	2	2	—	—	4	8	4	6	2	1	2	4	6
41	4	—	—	—	—	8	—	—	2	3	1	—	2	8
42	8	1	8	—	3	4	—	2	—	5	2	—	2	4
43	5	4	4	2	1	2	—	—	4	3	2	—	2	4
44	1	1	4	—	2	4	2	4	2	1	4	—	—	6
45	4	3	4	2	1	2	4	2	—	1	2	—	—	2
46	1	1	—	1	—	2	2	2	4	1	2	—	2	4
47	1	2	4	3	2	2	2	6	—	1	2	—	4	2
48	2	2	12	3	1	—	2	—	—	2	—	—	4	—
49	—	3	6	3	2	—	—	4	—	2	3	—	4	—
50	—	2	—	10	1	—	2	2	4	—	—	—	2	—
51	—	—	—	3	1	—	2	—	—	1	2	—	2	4
52	—	—	2	2	—	—	4	—	—	4	1	—	—	—
53	—	—	—	2	1	—	4	—	—	1	1	—	—	2
54	—	1	—	2	—	—	—	—	—	2	—	—	2	—
55	—	1	—	3	—	—	—	—	—	1	—	—	—	—
56	—	—	—	2	—	—	—	—	—	1	—	—	—	—
Total number	100	45	90	42[1]	44	87	52	84	94	64	82	100[2]	76	102
Average length cm *)		39.33	40.49	50.86	37.86	37.36	42.15	37.14	36.04	40.44	37.09	30.51	38.47	38.35

Area	A_3													
	N_8	N_8	N_8	N_7	N_8	N_8	N_8	N_8	M_8	N_8	N_8	N_8	N_8	N_8
Date of capture	2.—3. V 20	2.—3. V 20	2.—3. V 20	2.—3. V 20	3. V 20	3. V 20	3. V 20	3. V 20	3. V 20	3.—4. V 20	3.—4. V 20	3.—4. V 20	3.—4. V 20	3.—4. V 20
Fishing-place	6 miles W by S of Red Cliff	6 miles W by S of Red Cliff	8 miles NW of Hornum	14 miles S of Amrum	4 miles W of Red Cliff	7 miles W by S of Amrum	5 miles W of Red Cliff	5 miles W by S of Red Cliff	14 miles WSW of Red Cliff	4 miles W of Hornum	3 miles W by S of Red Cliff	10 miles W by S of Amrum	11 miles W of Hornum	40 miles S by W of Graa Deep
Depth in m	14	14	15	16	15	14	17	16	17	13	11	14	18	16
Weight of catch in kg.	1500	2100	700	700	1000	1000	1000	1200	800	1000	800	1000	1300	1000
Weight of sample in kg.	34	30	32	28	32	29	31	29	32	27	27	30	34	30
Length cm														
23	2	1	1	—	—	—	—	1	1	—	—	—	—	1
24	4	6	2	1	1	2	1	1	2	5	2	—	2	1
25	7	5	—	7	1	5	11	4	15	22	10	3	2	3
26	20	7	3	25	3	10	16	10	17	26	25	19	3	8
27	14	5	7	30	11	9	23	16	20	21	25	18	5	3
28	13	13	8	15	11	13	15	13	10	18	23	13	6	6
29	20	18	12	11	12	29	12	10	12	12	17	20	7	15
30	15	20	8	11	16	14	12	16	10	12	9	11	13	15
31	14	10	13	9	15	11	12	8	10	1	8	8	14	17
32	4	6	18	4	11	8	4	7	8	2	3	6	10	16
33	3	6	11	3	6	2	6	8	4	5	2	8	16	9
34	4	3	5	2	9	1	5	3	7	1	—	4	12	4
35	—	1	6	2	1	4	3	2	4	—	—	2	6	1
36	—	—	4	—	1	—	—	—	—	—	—	—	4	2
37	—	—	—	—	2	1	—	1	—	—	—	1	1	1
38	—	—	2	—	1	—	—	—	—	—	—	—	1	—
39	—	—	—	—	—	—	—	—	—	—	—	—	1	1
40	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41	—	—	—	—	—	—	—	—	—	—	—	2	1	
42	—	—	—	—	—	—	—	—	—	—	—	—		—
43	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	120	101	100	120	101	109	120	100	120	125	124	115	104	103
Average length cm *)	28.38	29.03	30.92	28.10	30.34	29.13	28.64	29.18	28.60	27.35	27.74	28.97	31.45	30.28

*) Not corrected by 0.5. — [1]) 57 cm: 2 spec.; 60 cm: 2 spec. — [2]) 24 cm: 1 spec. — [3]) 24 cm: 1 spec.; 57 cm: 2 spec.; 60 cm: 2 spec. — [4]) 57 cm: 1 spec.;

ments (continued).

C_2			C_2										Area
L_8	L_8		K_9	?	K_9	K_9	?	K_9	K_9	K_9			
23.—24. VII 19	23.-24.-25. VII 19	July 1919	6.—7. IX 19	13.—14. IX 19	13.-14.-15. IX 19	13.-14.-15.-16. IX 19	13.-14.-15.-16.-17. IX 19	14.—15. IX 19	14.-15.-16. IX 19	20.-21.-22. IX 19	Sept. 1919	June—Sept. 1919	Date of capture
80 miles W by S of Graa Deep	67 miles W by N of Graa Deep		90 miles W by N of Graa Deep	Dogger Bank	100 miles W by N of Graa Deep	100 miles W by N of Graa Deep	Dogger Bank	105 miles W by N of Graa Deep	104 miles W by N of Graa Deep	100 miles W by N of Graa Deep			Fishing-place
45	45		55	41	43	41	44	45	42	47			Depth in m
400	300		400	3000	5000	2000	2000	2000	2000	300			Weight of catch in kg
50	45		50	60	78.5	42	—	56	54	140			Weight of sample in kg
		Total									Total	Total	Length cm
—	—	3	—	—	—	—	1	—	—	—	1	4	25
—	—	7	—	2	—	—	—	2	—	—	4	11	26
2	—	24	—	—	—	—	1	—	4	—	5	29	27
2	1	24	—	2	—	—	1	2	2	—	7	31	28
2	—	36	2	—	2	—	2	—	—	3	9	45	29
4	5	54	—	2	4	1	1	—	—	—	8	62	30
8	13	60	—	—	7	3	1	4	—	2	17	77	31
10	8	74	2	10	6	4	5	2	—	—	29	103	32
14	15	94	—	6	4	3	3	4	—	—	20	114	33
8	15	88	—	8	10	4	7	4	—	2	35	125	34
10	10	79	—	10	5	7	7	8	10	—	47	126	35
2	10	77	—	6	13	5	13	6	6	4	53	132	36
4	5	57	2	4	8	8	10	4	4	—	40	97	37
6	2	53	—	12	12	7	9	12	10	6	68	123	38
6	—	31	—	6	3	4	8	2	4	—	27	66	39
6	1	48	—	10	8	3	10	4	8	12	55	107	40
2	1	27	4	—	6	5	6	12	4	8	45	80	41
—	3	34	2	8	11	4	4	6	6	8	49	87	42
2	2	32	4	—	4	3	2	2	4	10	29	63	43
4	—	34	8	—	3	2	2	6	8	14	43	81	44
2	—	25	4	2	2	2	2	—	2	12	26	55	45
—	—	21	2	—	3	3	1	2	4	8	23	48	46
4	1	35	6	—	2	—	—	—	—	12	20	57	47
—	1	27	4	—	2	—	—	4	2	12	24	57	48
—	—	27	4	—	—	—	—	—	—	2	6	35	49
2	—	25	6	—	3	—	—	—	2	6	17	44	50
—	—	15	—	—	1	—	—	—	—	6	7	22	51
—	1	14	—	—	—	—	—	—	—	10	10	26	52
—	—	11	2	—	1	—	—	—	—	2	5	16	53
—	—	7	—	—	2	—	—	—	—	6	8	15	54
—	—	5	—	—	—	—	—	—	—	—	—	5	55
—	—	3	2	—	—	—	—	—	—	—	2	5	56
100	94	1156 [3])	54	88	122	70 [4])	96	86	80	145	741 [5])	1957 [6])	Total number
35.84	34.61	37.65	44.96	36.23	38.39	38.34	37.05	38.14	39.30	44.63	39.74	38.62	Average length cm

A_3														Area
N_8	M_8	N_8	M_8	N_8	N_8	N_8	N_3	N_8	N_9	N_9	M_8	N_{10}	N_8	
3.-4.-5. V 20	3.-4.-5. V 20	4.—5. V 20	4.—5. V 20	4.—5. V 20	6. V 20	7.—8. V 20	7.-8.-9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	Date of capture
10 miles W of Amrum Light	36 miles SW of Graa Deep	6 miles W of Amrum	10 miles W of Hornum	6 miles W of Amrum Light	27 miles SSW of Graa Deep	8 miles W of Amrum Light	10 miles W of Amrum Light	6 miles W of Hornum	7 miles NW of Lister Deep	9 miles NW of Red Cliff	15 miles WSW of Hornum	8 miles WNW of Blaabjerg	6 miles W of Amrum	Fishing-place
14	19	13	19	17	13	16	13	15	17	17	12	17	17	Depth in m
1500	400	1500	1200	2000	700	2500	300	1500	900	1000	1000	600	700	Weight of catch in kg
31	29	25	45	27	35	27	27	34	52	43	28	27	27	Weight of sample in kg
														Length cm
—	—	1	—	—	—	—	4	—	—	1	—	—	—	23
2	1	4	—	1	1	9	4	—	—	—	—	—	5	24
1	15	15	—	10	1	12	10	8	—	2	5	1	16	25
4	10	17	1	11	5	24	12	1	—	6	11	3	21	26
5	12	12	1	15	10	25	20	7	4	5	10	4	16	27
13	11	22	4	18	14	15	19	3	4	9	22	15	15	28
10	5	8	3	14	12	16	18	6	10	10	24	11	15	29
12	8	14	13	13	18	7	11	20	16	13	15	10	12	30
15	15	7	18	8	19	1	8	23	11	13	11	10	5	31
10	1	6	12	5	13	6	3	8	20	17	5	10	5	32
8	6	1	8	4	9	3	3	11	14	9	2	2	3	33
10	1	2	17	5	6	—	5	10	8	10	3	6	3	34
2	5	—	13	3	3	—	—	—	18	9	1	4	—	35
5	2	—	8	3	1	2	—	4	14	7	—	2	1	36
1	2	—	3	—	1	—	—	1	2	2	1	2	—	37
—	3	—	6	—	—	—	—	—	—	1	—	—	1	38
1	—	—	2	—	—	—	—	—	—	3	—	—	—	39
2	2	—	—	—	—	—	—	1	2	1	—	1	—	40
—	—	—	2	—	—	—	—	—	2	—	—	—	—	41
—	—	—	1	—	—	—	—	—	—	1	—	—	—	42
—	1	—	1	—	—	—	—	—	—	—	—	—	—	43
101	100	109	113	110	113	120	117	103	125	119	110	81	118	Total number
30.90	29.63	27.87	33.21	28.98	30.20	27.53	28.09	30.74	32.60	31.58	28.95	30.57	27.99	Average length cm

Table of Measure-

Area	A_3													
	M_9	N_8	L_9 ?	L_9 ?	N_8	N_8	N_8	N_8	N_8	N_8	N_8	N_8	M_8	N_8
Date of capture	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.—9. V 20	8.-9.-10.-11. V 20	9. V 20	9. V 20	9. V 20	9. V 20	9. V 20	9. V 20
Fishing-place	43 miles NW of Hornum	7 miles W by N of Amrum	55 miles W by S of Graa Deep	50 miles W by S of Graa Deep	10 miles W by S of Amrum	8 miles W of Amrum Light	10 miles W of Hornum	Between Amrum and Amrumbank Light-Ship	6 miles W of Hornum	5 miles W of Hornum	10 miles W by S of Hornum	8 miles WNW of Hornum	29 miles W of Red Cliff	8 miles W of Hornum
Depth in m	13	14	15	14	14	15	15	10	13	14	13	14	14	14
Weight of catch in kg	2000	2000	2500	1000	1500	800	900	2000	1200	1500	1800	700	700	500
Weight of sample in kg	28	26	27	28	27	31	32	28	27	27	27	26	56	34
Length cm														
23	—	—	4	2	—	—	—	—	—	1	2	3	—	—
24	—	1	15	12	3	2	—	—	12	—	2	10	—	—
25	2	7	28	32	11	1	6	1	18	6	12	14	—	6
26	15	14	27	25	21	10	9	11	21	11	8	15	—	7
27	20	10	27	28	12	14	11	12	24	13	12	18	10	11
28	27	17	10	9	13	13	12	12	16	20	9	17	12	12
29	21	16	8	9	15	12	12	15	17	20	14	10	17	10
30	12	13	12	10	10	12	20	15	11	11	14	5	14	11
31	8	10	1	3	8	19	8	17	3	10	13	9	26	12
32	3	11	3	2	7	8	11	5	4	3	9	5	14	7
33	3	3	—	—	4	5	16	4	—	5	2	3	12	6
34	—	—	—	—	2	3	4	3	—	2	1	2	13	5
35	—	—	—	—	1	2	1	3	—	2	1	-	10	10
36	—	—	—	—	—	—	2	1	—	—	2	—	7	1
37	1	—	—	1	—	1	1	—	—	1	1	1	2	2
38	—	1	—	1	—	2	—	—	—	—	—	1	2	1
39	—	—	—	—	—	—	—	1	—	—	—	—	2	1
40	—	—	—	—	—	1	—	1	—	—	1	—	—	—
41	—	—	—	—	—	—	—	—	—	—	—	—	—	1
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Total number	112	103	135	134	108	105	113	101	126	105	103	113	141	103
Average length cm *)	28.44	28.76	26.53	26.75	28.39	29.70	29.95	29.67	27.17	28.82	28.92	27.72	31.50	30.36

Area	A_3													
	N_8	N_8	N_8	N_8	N_8	N_8	N_8	N_8	N_8	M_8	N_8	N_8	N_8	N_8
Date of capture	10.—11. V 20	10.—11. V 20	10.-11.-12. V 20	10.-11.-12. V 20	10.-11.-12.-13. V 20	11. V 20	11. V 20	11. V 20	11. V 20	11. V 20	11. V 20	11. V 20	11. V 20	11. V 20
Fishing-place	8 miles W by N of Amrum Light	40 miles SSW of Graa Deep	6-8 miles W of Hornum	8 miles W by N of Hornum	6 miles W of Hornum	9 miles W of Amrum Light	8 miles WSW of Hornum	8 miles W of Hornum	8 miles W by S of Red Cliff Light	4 miles NE of Amrumbank Light-Ship	7 miles W of Hornum	8 miles W of Hornum	8 miles WSW of Hornum	7 miles W by S of Red Cliff Light
Depth in m	15	13	12	15	15	15	13	15	16	15	14	15	15	15
Weight of catch in kg	1500	500	1200	1000	?	2500	800	500	1000	1500	1900	1500	1500	1600
Weight of sample in kg	31.5	28.5	29.5	29.5	32	26.5	32.5	30.5	33.5	34	31.5	32.5	28.5	33.5
Length cm														
23	—	1	2	—	—	—	—	—	—	—	—	—	—	—
24	6	2	13	3	2	2	1	3	—	11	2	2	4	1
25	18	6	25	10	10	10	7	6	—	12	12	5	16	3
26	30	15	34	22	12	16	23	13	8	15	10	7	25	6
27	30	20	15	20	15	25	25	17	5	18	20	10	32	13
28	18	20	20	20	14	24	27	14	13	15	20	17	18	17
29	22	23	7	14	18	14	12	28	15	18	14	9	10	14
30	7	14	6	14	16	13	10	8	11	13	8	15	5	15
31	1	5	7	7	14	4	7	7	17	10	5	18	6	20
32	5	6	4	5	5	3	7	6	16	9	12	9	2	10
33	2	1	—	3	8	1	4	9	5	6	2	1	3	6
34	2	2	3	3	2	1	4	1	4	2	5	7	1	5
35	—	1	1	2	4	—	—	1	4	1	3	1	—	3
36	2	1	—	—	1	—	—	1	2	1	1	2	—	—
37	—	—	—	—	1	1	—	1	—	1	1	2	—	1
38	1	—	1	—	—	—	—	—	—	2	—	—	—	—
39	—	—	—	1	1	—	—	—	—	—	1	—	—	1
40	—	—	—	1	—	—	1	—	—	—	—	—	—	—
41	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Total number	144	117	138	125	123	114	128	116	100	134	116	106 [1])	122	115
Average length cm *)	27.58	28.35	27.07	28.38	29.16	27.90	28.32	28.90	30.24	28.51	28.84	29.74	27.35	29.80

*) Not corrected by 0.5. — [1]) 42 cm: 1 spec. — [2]) 45 cm: 1 spec.

ments (continued).

A3														Area
M_8	M_8	N_8	N_8	N_8	M_8	N_8	N_8	N_8	M_8	M_8	M_8	N_8	N_8	
9. V 20	9.—10. V 20	9.—10. V 20	9.—10. V 20	9.—10. V 20	9.—10. V 20	9.—10. V 20	9.-10.11. V 20	10.—11. V 20	10.—11. V 20	10.—11. V 20	10.—11. V 20	10.—11. V 20	10.—11. V 20	Date of capture
14 miles W by S of Hornum	15 miles W by S of Hornum	7 miles W of Amrum	10 miles WSW of Hornum	12 miles W of Red Cliff	15 miles W of Amrum	5 miles ESE of Amrumbank Light-Ship	12 miles W of Amrum	7 miles W of Hornum	5 miles NE by N of Amrumbank Light-Ship	40 miles W of Hornum Light	14 miles W of Amrum Light	W of Red Cliff	45 miles SSW of Graa Deep	Fishing-place
15	15	14	14	15	19	16	17	13	16	19	15	13	15	Depth in m
1000	2000	1000	1000	2000	1500	2000	1500	2000	2000	1500	2000	1400	2000	Weight of catch in kg
26	36	29.5	31.5	34.5	31.5	31	29	27	35.5	30.5	31.5	23	30.5	Weight of sample in kg
														Length cm
5	—	—	—	—	—	5	—	1	—	1	3	—	—	23
7	—	8	—	—	—	3	1	3	1	2	3	—	—	24
16	1	31	6	3	4	8	2	19	2	7	10	—	1	25
11	8	15	18	5	2	5	3	19	17	19	15	2	1	26
10	6	23	17	9	9	15	12	21	14	13	12	10	13	27
7	11	24	22	9	14	7	13	16	17	20	13	8	15	28
11	16	13	20	7	10	19	18	15	9	25	13	10	12	29
7	15	5	13	21	10	13	14	6	13	11	11	16	21	30
8	20	8	7	23	8	12	14	2	16	10	8	28	15	31
8	14	4	5	6	19	5	6	5	7	7	10	8	15	32
5	7	2	3	9	7	3	7	4	7	3	3	20	5	33
4	5	2	2	5	7	2	8	4	6	5	5	16	2	34
1	4	2	2	3	6	3	2	1	3	1	4	12	3	35
1	—	1	2	6	2	2	3	—	1	—	2	—	1	36
1	1	—	—	1	1	2	—	—	2	—	2	6	2	37
—	—	—	—	—	—	1	1	—	2	—	—	—	—	38
—	—	—	—	—	—	—	—	—	—		—	—	—	39
—	1	—	1	—	1	—	—	—	2	—	—		—	40
—	—	—	—	—	—	—	—	—	1	—	—	2	—	41
—	—	1	—	—	—	—	—	—	—	—	1		—	42
—	1	—	—	—	—	—	—	—	—	—	—	—	1	43
102	110	139	118	107	100	105	104	116	120	124	115	138	107	Total number
28.21	30.42	27.59	28.72	30.50	30.61	29.02	30.07	27.75	29.90	28.58	29.05	31.65	30.24	Average length cm

A3														Area
N_9	N_{10}	N_8	M_8	N_8	M_8	M_8	M_8	N_9	N_8	N_8	N_9	N_8	N_8	
11. V 20	11. V 20	11.—12. V 20	11.—12. V 20	11.—12. V 20	11.—12. V 20	11.-12.-13. V 20	12. V 20	12. V 20	12. V 20	12. V 20	12. V 20	12. V 20	12.—13. V 20	Date of capture
15 miles SSW of Graa Deep	10 miles NNW of Blaabjerg	7 miles WSW of Hornum	10 miles W by N of Hornum	6 miles NW of Hornum	17 miles W by S of Amrum Light	40 miles W of Hornum	12 miles WNW of Hornum	15 miles SSW of Graa Deep	8 miles W of Hornum	8 miles W by N of Hornum	7 miles NW of Red Cliff	8 miles W by N of Hornum	10 miles NE of Amrumbank Light-Ship	Fishing-place
14	19	15	13	15	15	15	15	14	15	14	13	15	13	Depth in m
400	1000	700	1000	2000	1500	900	1500	700	2500	2000	12000	1000	1300	Weight of catch in kg
34.5	42	32.5	26.5	30	31	27.5	29.5	27.5	31.5	30.5	28.5	31.5	31.5	Weight of sample in kg
														Length cm
1	—	3	—	2	—	—	1	—	—	4	—		—	23
2	—	5	2	4	3	1	7	4	2	5	—	3	2	24
5	—	7	3	15	8	3	10	13	6	11	7	11	4	25
22	5	13	16	32	12	8	12	25	6	9	20	16	15	26
30	8	11	11	32	10	15	12	27	20	17	30	25	17	27
26	12	16	19	20	16	17	21	16	10	21	23	17	18	28
28	15	12	24	16	16	14	12	10	8	15	19	25	17	29
13	8	16	15	2	8	17	9	11	24	11	15	11	14	30
9	19	15	8	10	5	9	10	4	18	7	6	10	8	31
3	14	11	2	4	11	8	5	4	3	8	8	6	11	32
2	13	7	—	1	9	2	5	2	5	3	6	1	5	33
—	9	3	2	—	6	3	1	2	4	6	4	2	1	34
—	3	1	—	—	1	2	2	—	1	2	2	1	1	35
—	1	2	1	—	2	—	2	—	—	1	—	2	1	36
—	4	1	—	1	—	1	—	—	1	—	1	—	1	37
	—	—	1			1	2	—	2	1	—	—	1	38
—	1	—	—	—	1	—	—	—	—	1	—		—	39
—	—	—	—	—	—	—	—	—	1	—	1	—		40
—	—	—	—	—	—	—	1	—	—	—	1	—	1	41
141	114	123	104	139	108	101	112	118	111	122	144 [3])	130	117	Total number
28.01	30.94	29.02	28.54	27.37	29.26	29.23	28.67	27.58	29.45	28.62	28.88	28.30	29.06	Average length cm

Table of Measu

Area	A_3													
	N_9	N_9	N_8	M_8	N_8	N_8	N_{10}	N_8	M_8	N_8	N_9	M_8	N_8	N_8
Date of capture	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	12.—13. V 20	13. V 20	13. V 20	13.—14. V 20	13.—14. V 20	13.— V 2
Fishing-place	10 miles SSW of Graa Deep	3 miles S of Red Cliff Sand	6 miles W by N of Hornum	43 miles SW of Graa Deep	5 miles W of Red Cliff Light	7 miles W of Hornum	7 miles WNW of Blaabjerg	7 miles SW of Red Cliff	3 miles NW of Amrumbank Light-Vessel	30 miles S of Graa Deep	14 miles S by W of Graa Deep	3 miles SW of Amrumbank Light-Vessel	34 miles SSW of Graa Deep	8 mil NW Hornu
Depth in m	13	13	13	19	15	16	19	13	17	13	15	16	14	13
Weight of catch in kg	750	900	600	2000	2000	2000	800	2000	400	750	500	400	1500	1000
Weight of sample in kg	31.5	30.5	32.5	34.5	31.5	35.5	37.5	31.5	33.5	30.5	33	59	33	33.5
Length cm														
23	—	—	—	—	—	—	—	7	—	—	—	—	—	1
24	3	2	2	—	—	2	1	13	3	5	—	—	3	—
25	14	17	6	3	—	3	1	20	1	11	2	—	8	6
26	27	33	18	4	6	6	6	17	4	32	18	—	8	10
27	40	25	17	12	13	10	5	26	6	28	22	5	15	16
28	24	13	17	11	15	10	10	15	12	18	26	5	10	16
29	10	18	15	10	28	16	13	13	9	6	21	4	14	15
30	13	7	10	17	8	8	9	12	12	12	19	6	9	21
31	5	5	6	21	15	15	17	6	9	4	9	10	8	13
32	3	3	5	8	9	5	14	3	13	5	5	10	8	8
33	1	—	2	4	10	15	11	2	10	3	3	6	4	7
34	—	1	2	7	3	7	10	4	7	2	1	6	11	1
35	—	2	—	6	2	3	2	—	6	—	2	8	4	4
36	—	3	—	5	—	1	5	1	—	—	1	2	4	1
37	—	1	—	2	—	2	3	1	—	—	2	9	2	2
38	—	—	—	1	1	1	—	—	3	—	—	7	—	—
39	—	—	—	—	—	—	2	—	—	—	—	6	—	—
40	—	—	—	—	—	2	—	—	2	—	—	8	1	—
41	—	—	—	1	—	—	—	1	2	—	—	12	—	—
42	—	—	—	—	—	1	—	—	—	—	—	8	—	—
43	—	—	—	—	—	—	—	—	1	—	—	10	—	—
Total number	140	130	100	112	110	107	109	141	100	126	131	125 [1]	109	121
Average length cm *)	27.43	27.71	28.16	30.63	29.75	30.52	31.05	27.46	31.12	27.56	28.79	36.00	29.81	29.36

Area	A_3													
	N_8	N_8	N_9	N_8	M_8	N_8	M_8	N_8	M_8	N_8	N_8	N_8	N_9	M_7
Date of capture	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	16.— V 2
Fishing-place	7-8 miles W of Hornum	7 miles W of Hornum	15 miles SW of Graa Deep	30 miles SSW of Graa Deep	10—12 miles W of Hornum	7 miles W by S of Hornum	13 miles W of Hornum	7 miles WSW of Red Cliff	2 miles WSW of Amrum Bank	10 miles WSW of Hornum	40 miles SSW of Graa Deep	5 miles W of Hornum Light	6 miles W of Sønderho	5 mil ESE Amrum Light-Ve
Depth in m	15	14	19	15	17	15	14	15	14	15	15	12	11	18
Weight of catch in kg	400	1500	600	1500	1000	1200	1700	1000	1400	1500	2000	2500	600	2200
Weight of sample in kg	33.5	32.5	36.5	32.5	33.5	33.5	33	33.5	31	28.5	31.5	29.5	28.5	26.5
Length cm														
23	—	—	—	—	—	1	—	—	—	1	—	1	—	1
24	1	1	—	3	3	3	2	—	2	4	—	—	17	2
25	5	3	3	8	3	8	4	2	5	5	5	6	30	3
26	18	10	5	27	10	9	15	6	10	17	10	17	48	17
27	16	10	4	15	20	21	30	10	21	13	12	28	19	9
28	10	18	10	26	12	12	22	16	11	24	16	15	15	18
29	19	25	8	29	23	11	21	16	11	13	13	17	8	15
30	15	10	8	13	12	12	8	11	12	14	18	7	4	10
31	12	11	12	5	15	15	8	16	12	14	10	12	4	10
32	4	6	15	3	8	8	13	6	5	3	8	6	1	4
33	10	5	11	4	10	13	5	13	10	4	7	4	—	2
34	4	6	10	1	1	4	3	3	3	1	3	3	—	6
35	2	2	4	—	1	1	1	4	1	—	7	1	—	3
36	1	2	3	2	1	2	—	2	4	—	2	—	—	—
37	2	2	3	1	1	1	—	—	1	1	3	—	—	—
38	1	—	1	—	—	1	—	—	—	—	—	—	—	—
39	1	—	—	—	—	—	—	2	—	—	—	—	—	—
40	—	—	1	—	—	1	—	—	—	—	—	—	—	—
41	—	—	1	—	—	—	—	—	—	1	—	—	—	—
42	—	—	—	—	—	—	—	—	1	—	—	—	—	—
43	—	—	1	—	—	—	—	1	1	—	—	—	—	—
Total number	121	111	100	137	120	123	132	108	110	115	114	117	146	100
Average length cm *)	29.36	29.51	31.41	28.20	29.19	29.42	28.63	30.28	29.56	28.52	29.83	28.44	26.35	28.8

*) Not corrected by 0.5 — [1]) 44 cm: 2 spec.; 46 cm: 1 spec. — [2]) 49 cm: 1 spec.

nents (continued).

A_3														Area
N_8	N_9	M_8	N_8	M_{10}	M_8	N_8	N_8	M_8	N_8	N_8	N_8	M_7	N_8	
13.—14. V 20	13—14. V 20	13.—14. V 20	13.—14. V 20	13.—14. V 20	13.—14. V 20	13.-14.-15. V 20	14. V 20	15. V 20	15.—16. V 20	15.-16.-17.-18. V 20	16.—17. V 20	16.—17. V 20	16.—17. V 20	Date of capture
3 miles W of Hornum	7 miles W of Hornum	2 miles SSE of Amrumbank Light-Vessel	5 miles SW of Red Cliff	Slugen N	10 miles W of Hornum	7 miles NW by W of Red Cliff Light	7 miles W by N of Hornum	15 miles WSW of Red Cliff Light	7 miles W by N of Hornum Light	10 miles W 1/2 S of Hornum	3 miles NNW of Hornum	5 miles S of Amrumbank Light-Vessel	6-7 miles W by N of Hornum Light	Fishing-place
12	15	19	10	19	15	14	15	19	13	14	10	17	13	Depth in m
400	1000	2000	1000	800	2000	600	150	900	2700	2500	800	700	3000	Weight of catch in kg
29.5	33.5	44	26.5	39.5	31.5	31	29.5	33.5	31	31.5	31.5	37.5	31.5	Weight of sample in kg
														Length cm
4	1	—	1	—	—	—	—	1	—	2	2	—	—	23
6	5	—	—	2	1	5	3	2	1	1	1	2	5	24
13	9	—	6	3	1	10	6	2	9	4	8	3	1	25
25	16	—	30	4	5	18	18	15	7	8	31	4	12	26
16	21	2	27	2	12	28	19	9	10	25	25	5	11	27
14	13	4	15	7	10	11	21	4	23	21	23	8	19	28
16	11	5	11	7	18	14	13	10	16	20	19	5	12	29
10	18	12	8	13	15	20	13	5	8	10	14	15	16	30
11	8	13	4	6	6	7	6	4	13	5	9	8	15	31
6	4	10	3	10	10	3	9	18	7	13	2	10	6	32
2	8	15	1	12	10	2	3	10	10	3	1	4	6	33
1	5	11	1	15	6	4	4	8	5	1	—	5	3	34
—	4	5	1	6	5	2	1	6	2	3	—	7	4	35
1	2	5	1	6	2	—	1	4	—	1	—	6	2	36
—	1	4	2	—	—	1	—	2	—	—	—	8	1	37
—	—	4	—	4	1	1	—	2	—	—	—	1	—	38
—	1	3	—	—	—	—	—	—	—	—	—	2	—	39
—	—	4	—	1	—	—	1	—	1	2	—	3	—	40
—	—	1	—	—	—	—	—	—	—	—	—	1	—	41
—	1	1	—	2	—	—	—	—	—	—	—	3	—	42
—	—	1	—	—	—	—	—	—	—	1	—	—	—	43
125	128	100	111	100	102	126	118	102	112	120	135	100	113	Total number
27.74	29.02	33.21	27.86	31.84	30.20	28.32	28.63	30.51	29.34	29.08	27.72	32.11	29.38	Average length cm

A_3														Area
N_8	N_9	N_9	N_8	M_7	N_8	N_8	N_8	M_8	N_9	M_7	N_8	M_8	N_{10}	
6.-17.-18. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17. V 20	17.—18. V 20	17.—18. V 20	Date of capture
8 miles SW of Amrum	10 miles SW by W of Graa Deep	3 miles ESE of Graa Deep Light-Vessel	4 miles WSW of Red Cliff Light	4 miles S of Amrumbank Light-Vessel	10 miles ENE of Hornum	6 miles NNW of Hornum	5 miles SW of Red Cliff	2 miles S of Amrumbank Light-Vessel	10 miles W of Hornum	Between Helgo-land and Amrum	7 miles W by S of Red Cliff	2 miles NW of Amrumbank Light-Vessel	7 miles WNW of Blaabjerg	Fishing-place
19	17	13	13	19	13	13	13	19	13	19	16	14	17	Depth in m
4000	500	400	1500	800	8000	2000	800	600	2000	1500	1500	250	1000	Weight of catch in kg
31	30.5	46	33.5	63	29.5	28	26 5	25.5	28.5	36.5	32.5	33.5	33.5	Weight of sample in kg
														Length cm
1	—	—	—	—	—	—	—	1	1	—	1	—	—	23
—	1	1	3	—	3	1	1	3	3	—	4	—	—	24
3	5	—	11	4	20	3	5	18	4	—	12	—	1	25
8	11	2	19	—	13	15	18	21	12	—	14	8	—	26
12	17	2	14	2	23	20	25	25	15	—	10	10	11	27
15	7	2	16	10	8	16	17	15	12	—	10	10	12	28
13	18	8	20	4	16	9	15	9	15	—	15	12	10	29
13	16	6	16	4	13	9	13	14	14	2	12	8	12	30
14	11	14	9	4	12	8	7	5	18	—	10	16	15	31
8	7	19	8	6	3	6	4	1	6	—	10	10	12	32
12	4	16	5	10	4	7	4	3	7	4	10	7	14	33
3	4	13	3	6	3	3	1	1	3	4	1	7	7	34
1	3	9	1	10	1	1	—	1	1	3	5	7	2	35
1	—	11	—	4	—	3	—	—	—	2	3	4	1	36
3	1	7	—	12	2	2	—	—	—	9	2	—	2	37
—	—	3	—	14	—	—	—	1	—	11	1	1	1	38
—	2	1	—	6	—	1	—	—	—	10	2	2	—	39
—	1	—	1	10	—	—	—	—	—	4	—	1	—	40
—	—	—	—	16	—	—	—	—	—	5	—	—	—	41
—	—	—	—	4	—	—	—	—	—	5	—	1	—	42
—	—	—	—	2	—	—	—	—	—	—	—	—	—	43
107	108	114	126	128	121	104	110	118	111	60 [2])	122	104	100	Total number
29.79	29.49	32.75	28.60	35.42	28.26	29.20	28.22	27.63	29.02	37.83	29.47	30.94	30.75	Average length cm

Table of Measure-

Area	A3													
	M_9	N_8	N_8	N_8	M_8	N_8	N_8	M_{10}	N_8	N_8	N_8	N_8	M_7	N_8
Date of capture	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.—18. V 20	17.-18.-19. V 20	18. V 20
Fishing-place	25 miles NW of Red Cliff	9 miles W of Hornum	7 miles NW of Hornum	8 miles SW by W of Red Cliff	50 miles SW by S of Graa Deep	8 miles WSW of Red Cliff	6 miles W of Amrum	20 miles N of Slugen	42 miles S by W of Graa Deep	10 miles NW of Hornum	5 miles W of Hornum	6-7 miles NW of Hornum	8 miles WSW of Amrum Light	6 miles W by N of Hornum
Depth in m	13	13	15	11	15	14	16	19	11	15	13	13	14	15
Weight of catch in kg	500	1500	2000	1300	700	5000	2000	1700	2000	3000	2000	2500	3000	1000
Weight of sample in kg	22	28.5	28	27	28.5	28.5	28.5	35.5	29.5	30.5	23.5	32	26.5	38
Length cm														
23	—	—	—	—	2	1	—	—	—	2	—	—	—	—
24	—	7	3	2	3	3	3	—	—	—	—	1	3	1
25	2	14	16	6	8	10	6	—	6	4	5	5	8	2
26	2	16	23	17	11	25	22	1	18	12	15	8	13	21
27	4	13	17	25	11	23	21	2	17	26	18	15	24	40
28	5	22	17	12	15	15	11	9	22	25	20	25	14	27
29	2	19	11	12	16	11	16	15	16	18	15	26	19	20
30	6	14	17	8	7	8	17	15	17	12	10	15	13	15
31	11	10	3	11	12	9	6	17	13	7	6	12	7	11
32	10	—	6	4	9	4	8	10	4	4	9	5	3	4
33	4	2	3	4	5	3	2	14	3	3	2	3	5	8
34	7	3	2	2	5	3	2	10	1	5	—	3	1	5
35	1	—	1	1	1	1	—	4	1	1	—	2	1	1
36	4	—	—	—	3	1	1	1	1	1	—	—	—	3
37	3	—	1	1	—	1	—	2	1	1	—	—	—	—
38	2	—	—	—	1	1	—	—	1	—	—	1	—	—
39	—	1	—	—	—	—	—	—	1	—	—	—	—	—
40	1	—	—	—	—	—	1	—	1	—	—	1	—	—
Total number	64	121	120	105	109	120 [1]	116	100	123	121	100	122	111	158
Average length cm *)	31.64	28.01	27.98	28.38	29.09	28.27	28.41	31.16	28.91	28.63	28.36	28.91	28.27	28.68

Area	A3													
	N_8	N_8	N_9	N_9	N_8	N_{10}	N_8	N_8	N_8	N_{10}	N_{10}	N_8	N_8	N_8
Date of capture	19.—20. V 20	19.-20.-21. V 20	20. V 20	20. V 20	20. V 20	20. V 20	20.—21. V 20	20.—21. V 20	21. V 20	21. V 20	21. V 20	21.—22. V 20	21.—22. V 20	21.—22. V 20
Fishing-place	8 miles WSW of Red Cliff	6-7 miles NW of Red Cliff	10 miles W of Lister Deep	2-3 miles W of Red Cliff Sand	5 miles W ½ S of Red Cliff	6 miles NW of Kjær-gaard	17 miles S of Red Cliff Sand	8 miles WSW of Red Cliff	10 miles W of Red Cliff	6-7 miles W by S of Blaabjerg	6 miles NW of Kjær-gaard	3 miles NNW of Hornum	5-6 miles W of Red Cliff	2 miles WSW of Red Cliff
Depth in m	15	15	13	15	13	15	17	15	15	17	16	15	13	14
Weight of catch in kg	2000	1000	700	600	1000	700	1000	600	1500	300	900	1000	1000	1000
Weight of sample in kg	27.5	42.5	29	32.5	30	29	29.5	30.5	30	35.5	35.5	37.5	31.5	25.5
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	2	—	—	—	2	—	—	3	6	1	1	5	—	1
25	12	1	—	—	4	—	—	6	18	2	2	15	2	13
26	14	8	3	10	6	4	3	10	18	4	7	20	11	43
27	25	5	5	12	12	8	5	25	17	10	8	23	16	14
28	22	6	4	19	11	10	5	25	10	6	9	16	17	15
29	17	13	5	9	13	10	7	7	12	10	15	20	10	9
30	10	7	8	12	11	16	7	8	10	7	9	20	20	8
31	11	12	12	11	14	5	12	13	10	11	13	9	8	6
32	3	13	6	12	10	5	12	5	7	8	9	9	12	5
33	2	8	11	8	7	10	11	6	2	6	8	3	7	3
34	2	13	15	4	3	11	8	3	3	10	10	7	10	2
35	1	9	8	2	6	3	2	1	2	10	10	3	2	1
36	—	5	1	1	2	5	7	4	—	8	2	—	1	2
37	—	1	2	2	1	2	2	3	—	2	1	1	—	—
38	—	4	4	2	—	1	—	—	—	2	—	—	—	—
39	—	1	1	1	—	1	2	1	1	1	—	1	—	—
40	—	3	2	—	—	—	1	—	1	—	1	—	—	—
41	—	—	1	—	—	—	—	—	—	—	1	—	—	—
42	—	2	2	1	—	1	—	—	—	1	—	—	—	—
43	—	—	—	—	—	—	—	—	—	1	—	1	—	—
44	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Total number	121	112 [5]	90	107 [6]	102	92	84	120	118	100	106	153	116	122
Average length cm *)	28.12	32.04	32.59	30.33	29.89	31.16	31.77	29.10	28.34	31.63	30.79	28.71	29.68	27.75

*) Not corrected by 0.5. — [1]) 43 cm: 1 spec. — [2]) 42 cm: 1 spec. — [3]) 41 cm: 1 spec. — [4]) 44 cm: 1 spec. — [5]) 45 cm: 1 spec. — [6]) 46 cm: 1 spec.

nents (continued).

A3														Area
N_8	N_8	N_8	N_8	N_8	N_8	N_{10}	N_8	N_8	N_8	M_7	N_8	M_8	N_8	
18. V 20	18. V 20	18. V 20	18. V 20	18. V 20	18. V 20	18.—19. V 20	18.—19. V 20	18.—19. V 20	18.—19. V 20	18.—19. V 20	18.—19. V 20	18.—19. V 20	19. V 20	Date of capture
W ½ W of Amrum Light	8 miles W of Red Cliff	10 miles SW of Amrum Light	10 miles WNW of Hornum	25 miles SSW of Graa Deep	7 miles SW of Red Cliff	10 miles NE of Sluqen	10 miles WSW of Red Cliff	8 miles W of Red Cliff	6 miles NW by W of Hornum	15 miles NNE of Helgo-land	7 miles W of Amrum	16 miles WSW of Amrum Light	35 miles SSW of Graa Deep	Fishing-place
17	17	17	16	15	14	17	13	11	11	19	15	15	13	Depth in m
1500	1000	1000	500	1000	1000	900	700	2000	1000	1500	2000	2000	800	Weight of catch in kg
33.5	31.5	34.5	29.5	29.5	30.5	32.5	29.5	31.5	28	34.5	31.5	29.5	34.5	Weight of sample in kg
														Length cm
	—	—	—	—	1	—	—	—	—	—	—	—	—	23
2	—	—	—	3	1	—	5	—	1	—	1	3	—	24
4	1	1	8	7	3	4	12	6	3	1	7	4	2	25
4	6	4	10	10	7	5	11	24	21	5	13	11	1	26
11	11	16	22	25	22	10	11	20	18	4	35	18	5	27
9	15	18	22	17	21	9	13	18	17	11	31	17	12	28
8	16	16	23	10	23	15	12	16	15	8	19	17	15	29
7	8	19	7	13	14	10	14	12	13	5	13	15	13	30
12	11	13	8	10	9	15	9	14	7	13	6	9	17	31
10	10	11	7	5	5	7	7	2	7	11	3	4	12	32
11	2	8	2	7	—	4	7	5	7	10	2	5	5	33
7	11	9	6	3	5	7	3	2	2	2	2	1	8	34
4	5	—	1	2	2	3	—	3	3	11	—	5	3	35
5	—	5	1	2	2	2	—	3	—	4	1	1	3	36
5	1	2	—	1	1	—	1	1	1	4	1	2	2	37
—	4	—	1	—	—	2	—	—	—	3	—	3	2	38
2	—	—	—	—	1	1	1	—	—	2	1	—	2	39
1	1	—	—	—	—	1	—	1	—	—	—	—	—	40
102	102	122	118	115	117	95	107 [2])	127	115	95 [3])	135	115	103 [4])	Total number
30.97	30.46	30.15	28.80	28.87	29.06	30.29	28.87	28.84	28.82	31.75	28.29	29.29	31.12	Average length cm

A3														Area
N_{10}	N_9	N_8	N_8	N_8	N_8	M_7	M_8	N_8	N_8	M_8	M_8	N_8	N_8	
22. V 20	22.—23. V 20	22.—23. V 20	22.—23. V 20	23. V 20	23.—24. V 20	23.—24. V 20	23.—24. V 20	23.—24. V 20	23.—24. V 20	24. V 20	24. V 20	24. V 20	24. V 20	Date of capture
5 miles W of Blaabjerg	8 miles SW of Graa Deep	7-8 miles W by S of Red Cliff	5-6 miles W by S of Red Cliff	10 miles SW ½ W of Red Cliff Light	5 6 miles WSW of Red Cliff	Between Helgoland and Amrumbank	54 miles SSW of Graa Deep	7-8 miles WNW of Hornum	5 miles WSW of Red Cliff	14 miles WNW of Hornum	14 miles W of Red Cliff	7-8 miles WNW of Hornum	42 miles SSW of Graa Deep Buoy	Fishing-place
13	14	15	15	13	15	19	19	16	14	15	13	15	16	Depth in m
1500	?	2000	3000	2000	500	1500	1600	1500	1100	1500	1200	700	1500	Weight of catch in kg
28.5	34	29.5	28	29.5	31	44.5	61	26.5	28.5	30	26	26.5	27.5	Weight of sample in kg
														Length cm
	—	—	—	—	—	—	—	—	—	—	1	—	—	23
	—	—	—	2	—	—	—	—	5	—	8	1	5	24
4	2	1	7	11	5	1	—	13	14	3	24	9	10	25
5	—	6	15	15	8	6	—	18	18	10	17	10	16	26
20	5	12	16	20	10	6	—	35	16	28	19	16	22	27
13	7	10	27	21	18	8	—	16	11	15	22	19	26	28
19	6	18	13	10	15	5	2	10	16	17	20	18	20	29
10	9	14	13	12	15	8	—	11	12	10	7	9	4	30
6	16	16	7	9	9	6	—	7	9	10	—	5	6	31
4	11	11	7	6	5	10	2	3	7	5	3	6	6	32
7	12	4	5	8	6	6	2	4	5	9	1	4	1	33
4	15	9	3	6	4	8	16	2	3	4	1	4	1	34
3	5	1	2	2	3	6	8	—	—	2	1	3	—	35
1	7	—	—	—	2	17	14	—	—	2	—	—	—	36
3	2	—	1	2	—	5	18	—	1	2	—	1	1	37
	—	—	—			5	16	—	—	1	—			38
	3	—	—		—	5	4	—	—	—	—	—		39
—	—	—	—	—	2	3	10	—	1	—	—	—	2	40
—	—	—	—	—	1	3	8	—	—	—	—	—	—	41
1	—	—	—	—	—	—	10	—	—	—	—	—	—	42
	—	—	—	—	1	—	—	—	—	—	—	—	—	43
—	—	—	—	—	—	—	2	—	—	—	—	—	—	44
100	100	102	116	124	104	108	112	119	118	118	124	105	120	Total number
29.60	31.97	29.88	28.75	28.82	29.87	32.99	37.34	27.89	28.38	29.33	27.21	28.78	28.08	Average length cm

Table of Measure-

Area	A_3													
	N_9	M_9	M_7	N_8	N_8	M_{10}	N_9	M_7	N_8	M_7	N_8	N_{10}	N_9	N_8
Date of capture	24.—25. V 20	24.—25. V 20	24.—25. V 20	24.—25. V 20	24.—25. V 20	25. V 20	25. V 20	25. V 20	25. V 20	25.—26. V 20	25.—26. V 20	25.—26. V 20	25.—26. V 20	26. V 20
Fishing-place	10 miles NW of Red Cliff	28 miles NW of Hornum	6 miles SW of Amrumbank Light-Ship	6 miles WNW of Hornum	6 miles W of Red Cliff	Slugen N	12 miles NW by W of Red Cliff	5 miles SW of Amrumbank Light-Ship	5-6 miles NW of Red Cliff	7—8 miles SW of Amrumbank Light-Ship	7 miles WNW of Hornum	8 miles N by W of Graa Deep	7-8 miles W of Lister Deep	5 miles WNW of Red Cliff Light
Depth in m	14	15	19	12	15	19	15	19	13	19	13	14	14	14
Weight of catch in kg.	1000	1600	3000	3000	1000	1500	1000	2000	1500	1500	2000	1000	1000	1500
Weight of sample in kg.	29.5	32	43.5	31.5	31.5	32	31.5	40	29.5	56.5	31	32	41.5	33
Length cm														
23	—	1	—	—	—	—	—	—	—	1	—	1	—	—
24	—	—	—	—	—	—	—	2	4	—	—	1	—	—
25	6	3	1	3	1	1	5	2	10	1	3	3	—	5
26	16	10	1	12	5	2	10	4	11	3	9	8	—	8
27	22	9	3	14	13	6	17	11	23	5	20	11	2	7
28	14	17	1	22	19	10	15	10	19	11	21	10	5	8
29	13	15	8	18	15	17	13	10	13	9	15	15	7	14
30	10	10	7	9	8	13	12	7	9	7	18	17	6	18
31	12	15	12	10	14	22	13	12	8	—	12	10	15	17
32	10	14	5	9	9	17	11	5	6	—	6	12	12	7
33	4	11	16	5	8	6	7	7	3	3	9	8	15	9
34	3	1	17	6	10	4	3	1	3	4	6	4	6	6
35	2	4	18	1	5	2	6	3	2	4	3	3	8	2
36	1	2	2	1	2	—	1	5	1	7	—	2	6	2
37	—	1	10	—	—	—	1	5	1	9	—	1	9	3
38	—	—	2	—	—	—	—	5	2	13	—	—	4	3
39	—	—	2	—	—	—	—	2	1	11	—	2	—	—
40	—	—	2	1	1	—	—	3	1	12	—	—	3	—
41	—	—	1	1	—	—	—	—	—	—	—	—	2	—
42	—	—	—	—	—	—	—	—	—	6	—	—	2	1
43	—	—	—	—	—	—	—	2	—	6	—	—	—	—
Total number	113	113	108	112	110	100	114	100 [1])	117	120 [2])	122	108	102	110
Average length cm *)	28.86	29.83	33.21	29.39	30.24	30.32	29.58	31.96	28.81	35.61	29.36	29.98	33.25	30.48

Area	A_3													
	N_9	N_8	N_9	N_9	M_9	M_9	N_9	N_9	N_9	N_8	N_8	N_8	N_8	N_8
Date of capture	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	27. V 20	27. V 20	27. V 20	27. V 20	27. V 20	27.—28. V 20	27.—28. V 20	27.—28. V 20	27.—28. V 20
Fishing-place	14 miles SSW of Graa Deep	4 miles NW of Red Cliff	abt. 10 miles WSW of Graa Deep	18 miles SSW of Graa Deep	12 miles WSW of Graa Deep	3 miles SW of Cancer	5 miles W of Graa Deep	6 miles NW of Red Cliff Light	20 miles S by W of Graa Deep	5 miles NW by W of Red Cliff	S by W of Red Cliff	WNW of Red Cliff	10 miles W of Red Cliff	SW of Red Cliff
Depth in m	13	13	15	15	16	15	17	13	14	13	13	13	17	13
Weight of catch in kg.	900	1800	200	1500	500	300	350	1500	500	1300	1500	2000	1500	4000
Weight of sample in kg	34.5	34.5	47	26.5	49	34	39.5	31.5	29	29	28	36.5	38.5	28.5
Length cm														
23	—	—	1	—	—	—	—	—	—	—	—	1	—	—
24	—	1	—	1	—	—	1	6	1	—	—	1	—	1
25	—	—	—	10	—	—	2	23	—	6	5	5	1	2
26	5	6	—	18	6	—	1	21	14	11	19	12	3	16
27	11	9	1	16	4	5	3	21	19	13	23	16	4	28
28	16	23	2	16	—	2	2	11	18	16	16	10	6	24
29	15	12	2	12	4	8	4	13	20	17	16	16	5	20
30	16	12	1	6	8	8	11	9	9	15	11	12	8	20
31	17	11	3	10	2	12	12	5	9	13	4	7	19	10
32	9	12	11	5	8	22	15	3	5	5	5	10	12	2
33	10	7	20	6	4	9	11	3	6	6	8	10	12	3
34	9	7	15	1	12	2	11	4	4	3	3	4	9	1
35	3	1	9	—	14	13	6	—	—	—	—	4	9	—
36	2	2	7	1	10	2	10	4	2	1	2	4	7	1
37	3	3	10	1	6	2	6	1	—	2	—	1	6	—
38	1	3	9	1	4	6	2	1	—	1	—	3	2	—
39	—	3	8	—	2	6	4	2	—	1	—	3	—	—
40	—	—	2	—	2	2	—	1	—	—	—	3	2	—
41	—	—	—	1	10	—	—	1	1	—	—	—	1	—
42	—	—	—	—	2	2	—	—	—	—	—	—	1	—
43	—	—	1	—	2	2	1	—	—	—	—	—	—	—
Total number	117	112	102	105	102 [4])	105 [5])	102	129	108	110	112	122	107	128
Average length cm *)	30.49	30.52	34.65	28.61	34.59	33.40	32.74	28.30	29.08	29.35	28.61	30.29	32.40	28.45

*) Not corrected by 0.5. — [1]) 44 cm: 4 spec. — [2]) 45 cm: 8 spec. — [3]) 46 cm: 1 spec. — [4]) 44 cm: 2 spec. — [5]) 45 cm: 2 spec. — [6]) 45 cm: 1 spec.

nents (continued).

A3														Area
N_9	N_8	N_9	N_9	N_8	N_9	N_9	N_9	N_9	N_9	N_8	N_{10}	N_9	N_8	
26. V 20	26. V 20	26. V 20	26. V 20	26. V 20	26. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	26.—27. V 20	Date of capture
At the North-Edge of List	6-7 miles S by W of Red Cliff Light	20 miles SSW of Graa Deep	8 miles W of Graa Deep	6 miles SW by W of Red Cliff Light	8 miles W by N of Graa Deep	6 miles SW of Sønderho	16 miles S by W of Graa Deep	5 miles W of Graa Deep	4 miles S of Red Cliff Sand	4-5 miles NW by W of Red Cliff	W ½ N of Blaabjerg	22 miles SSW of Graa Deep	3 miles NW by W of Red Cliff	Fishing-place
13	15	16	15	13	15	13	13	13	15	13	18	15	13	Depth in m
1400	1500	2000	400	1000	1000	500	1500	700	700	2000	1000	1000	1000	Weight of catch in kg
35	33.5	35.5	37.5	30.5	32.5	26	36	34.5	35.5	30	28.5	28.5	31	Weight of sample in kg
														Length cm
—	—	1	2	—	—	—	—	—	—	—	1	1	—	23
—	—	3	1	—	—	4	—	—	—	—	—	2	3	24
1	1	8	2	4	1	3	—	3	—	1	7	7	5	25
4	1	10	2	20	5	15	3	4	2	6	8	7	7	26
8	4	11	6	25	10	21	3	6	—	11	10	23	13	27
12	14	8	7	30	18	18	10	6	1	22	15	21	12	28
15	14	12	5	22	11	20	12	5	2	18	19	21	8	29
15	9	15	11	10	15	12	11	8	4	15	14	15	11	30
13	21	11	7	9	14	7	5	8	8	11	12	8	15	31
12	15	9	7	5	11	3	18	14	13	6	8	4	7	32
10	9	7	15	—	10	5	8	5	11	8	6	5	7	33
9	5	7	16	—	8	1	7	11	4	3	1	2	9	34
3	2	2	8	—	4	—	6	7	4	3	1	2	5	35
2	3	5	2	1	1	—	5	10	5	2	1	—	2	36
3	2	1	2	—	—	—	5	4	6	3	—	—	1	37
—	1	—	3	—	1	—	5	3	2	—	—	—	1	38
—	1	3	2	—	1	—	—	3	3	—	—	—	—	39
—	1	2	2	1	1	—	—	—	3	—	—	—	—	40
1	—	—	—	—	—	—	2	—	5	—	—	—	—	41
—	—	—	—	—	—	—	—	—	3	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
108	103	115	100	127	111	109	100	97	76	109	103	118	107 [5])	Total number
30.72	31.01	30.05	31.83	28.25	30.44	28.29	31.97	32.09	34.30	29.84	29.11	28.60	30.11	Average length cm

A3														Area
N_9	N_8	N_9	N_9	N_8	N_9	N_8	N_9	N_8	N_8	N_8	N_9	N_8	N_9	
27.—28. V 20	27.—28. V 20	27.—28. V 20	27.-28.-29. V 20	28.—29. V 20	28.—29. V 20	28.—29. V 20	28.—29. V 20	28.-29.-30. V 20	28.-29.-30. V 20	29. V 20	29. V 20	29.—30. V 20	29.—30. V 20	Date of capture
15 miles SSW of Graa Deep	W of Red Cliff	14 miles SSW of Graa Deep	12 miles NNW of Red Cliff Light	WNW of Hornum Light	10 miles SW by S of Graa Deep	32 miles SSW of Graa Deep	16-18 mls. SW by S of Graa Deep	40 miles SSW of Graa Deep	5 miles WNW of Red Cliff Light	10 miles NW of Hornum	25 miles SSW of Graa Deep	10 miles W of Hornum	11 miles W of List	Fishing-place
13	13	13	15	15	15	17	13	19	14	19	14	19	14	Depth in m
1500	1500	1000	2500	2000	2500	2000	3000	1600	1500	1500	1500	1700	1000	Weight of catch in kg
28	28.5	26.5	37	25.5	32	28.5	31.5	32.5	26	31.5	39.5	31.5	31.5	Weight of sample in kg
														Length cm
—	—	—	—	—	—	—	—	—	—	—	—	—	—	23
—	—	—	—	5	—	—	—	—	2	3	—	1	—	24
3	—	4	2	25	—	1	—	—	15	5	1	1	—	25
25	2	2	2	40	5	6	2	6	17	11	4	5	15	26
23	8	23	4	13	3	20	7	8	12	17	3	6	23	27
27	13	19	7	18	14	17	20	9	14	13	7	12	22	28
19	13	17	8	15	15	18	10	20	14	5	7	11	15	29
10	10	11	3	4	13	13	8	7	13	7	6	12	15	30
9	14	13	15	4	10	8	19	12	8	10	12	12	5	31
8	11	3	21	3	11	8	11	6	3	2	5	10	5	32
2	4	5	8	1	7	5	8	9	5	11	12	7	6	33
—	8	2	11	2	10	2	10	9	2	4	10	5	8	34
—	6	3	7	1	10	2	3	8	3	7	6	10	4	35
1	—	1	3	—	—	3	3	5	1	—	6	2	—	36
1	1	—	2	1	3	—	3	2	—	2	7	—	2	37
—	2	1	1	—	1	1	—	1	—	2	5	4	1	38
—	1	—	3	—	1	—	—	1	—	—	1	—	1	39
—	1	—	2	—	—	—	—	—	—	—	5	2	—	40
—	—	—	—	—	—	—	—	1	—	2	1	—	—	41
—	—	—	—	—	—	—	1	—	—	1	1	—	—	42
—	1	—	—	—	—	—	—	—	—	—	1	—	—	43
128	95	104	100 [6])	132	103	104	105	104	109	102	100	100	122	Total number
28.34	30.99	29.22	32.10	27.18	31.06	29.44	30.87	31.09	28.39	29.93	32.97	31.03	29.41	Average length cm

Table of Measure-

Area	A_3													
	N_9	N_9	N_8	N_9	N_8	M_9	N_8	N_8	N_8	N_9	M_8	N_9	M_9	
Date of capture	29.–30. V 20	29. 30. V 20	29.-30.-31. V 20	30. V 20	30. V 20	30.—31. V 20	30.—31. V 20	30.—31. V 20	30.—31. V 20	30.—31. V 20	30.—31. V 20	30.—31. V 20	31. V 20	May 1920
Fishing-place	2 miles S of Red Cliff Sand	15 miles SSW of Graa Deep	10 miles W of Hornum	8 miles WSW of Graa Deep	10 miles W of Hornum	37 miles WSW of Graa Deep	10 miles W by S of Red Cliff	4 miles WSW of Red Cliff Light	7-8 miles NW of Hornum	17 miles SSW of Graa Deep	SSW of Amrumbank Light-Ship	20 miles SSW of Graa Deep	5 miles SW of Cancer	
Depth in m	15	13	13	15	14	17	17	13	16	17	19	15	15	
Weight of catch in kg.	1500	2000	2000	1700	2000	3000	2000	1500	1500	1500	2000	2500	750	
Weight of sample in kg	26	26.5	30.5	27.5	33.5	35	30	28	30.5	30.5	55	30.5	33.5	
Length cm														Total
23	—	—	—	—	—	—	—	—	—	—	—	1	—	99
24	2	1	1	—	—	—	4	6	1	1	—	—	1	504
25	15	7	1	7	—	—	7	8	1	7	—	15	—	1631
26	17	7	7	20	10	1	13	8	13	16	—	24	5	3090
27	31	29	18	15	26	8	14	13	15	25	—	22	16	3938
28	20	23	21	20	26	12	15	13	13	24	2	19	10	3860
29	16	13	14	10	20	10	10	10	15	21	—	18	10	3633
30	10	11	10	10	10	10	10	10	10	17	—	8	9	3028
31	5	8	10	8	15	10	8	10	8	9	4	6	8	2719
32	3	5	11	10	9	7	6	10	5	3	2	4	12	1992
33	2	6	5	7	6	12	10	5	10	2	6	4	12	1613
34	—	2	2	2	1	13	7	8	5	1	6	3	9	1259
35	—	1	4	4	2	11	3	—	4	—	6	4	7	801
36	—	—	4	—	1	9	—	2	—	1	14	1	2	529
37	—	—	—	—	1	1	2	1	5	1	20	1	4	420
38	—	—	1	—	—	—	1	3	3	—	14	1	—	276
39	—	—	2	—	2	2	1	—	—	—	14	1	1	185
40	—	—	—	2	—	2	—	—	1	—	8	—	1	168
41	—	—	1	—	—	—	—	—	—	—	8	—	—	110
42	—	—	1	—	—	—	—	—	—	—	4	—	—	76
43	—	—	—	—	—	—	—	—	—	—	4	—	—	47
44	—	—	—	—	—	—	—	—	—	—	—	—	—	12
45	—	—	1	—	—	—	—	—	—	—	4	—	—	18
46	—	—	—	—	1	—	—	—	—	—	—	—	—	4
Total number	121	113	114	115	130	108	111	107	109	128	116	132	107	30013 [1])
Average length cm *)	27.63	28.53	29.98	29.02	29.40	31.89	29.38	29.41	30.07	28.35	37.62	28.39	30.88	29.60

Area	A_3													
	N_9	N_9	N_9	N_9	N_9	N_8	N_9	N_8	N_9	N_9	N_9	N_9	N_8	N_8
Date of capture	31. V— 1. VI 20	31. V— 1. VI 20	1. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	1.—2. VI 20	2. VI 20	2. VI 20
Fishing-place	W of Lister Deep	18 miles SW by S of Graa Deep Gas Buoy	7 miles NW of Red Cliff	8 miles NW of Red Cliff Light	8 miles NW of Red Cliff Light	8 miles W of Red Cliff	24 miles SSW of Graa Deep	8 miles W by S of Red Cliff	SW of Lister Deep	10 miles SW of Graa Deep	7 miles NW of Red Cliff	10 miles W by N of Lister Deep	6 miles W of Red Cliff	7 miles W of Red Cliff
Depth in m	15	17	18	16	17	15	17	15	16	17	14	15	14	14
Weight of catch in kg.	1709	400	1500	2000	1000	1500	2000	1400	800	1500	1300	1500	500	500
Weight of sample in kg.	29.5	37	31	32.5	28	31.5	28.5	38	29	26.5	34.5	27.5	26	26
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	1	—	3
24	—	—	2	—	5	—	1	—	2	2	—	2	—	5
25	2	2	5	1	16	1	5	—	10	17	1	5	—	12
26	9	2	13	5	30	10	15	—	12	31	12	16	13	24
27	10	10	8	11	33	13	21	2	18	31	20	17	19	23
28	17	8	10	21	18	15	15	3	18	26	11	25	12	17
29	16	3	13	12	12	20	13	10	15	13	12	20	24	19
30	14	8	10	10	3	21	20	10	15	1	12	10	16	11
31	8	7	12	13	6	16	6	15	15	6	11	8	10	7
32	9	11	10	11	2	11	9	13	4	1	11	5	8	5
33	6	12	8	4	1	7	2	13	7	5	16	4	2	1
34	5	13	5	6	2	4	4	11	3	—	6	1	1	1
35	8	12	3	2	1	—	2	5	1	—	2	1	1	—
36	1	3	2	—	1	—	2	9	1	—	1	1	1	—
37	1	2	3	6	—	1	—	2	1	—	—	—	—	—
38	—	5	1	3	—	—	—	2	—	—	1	—	—	—
39	—	2	—	2	—	1	—	—	—	—	—	—	—	—
40	—	3	—	2	—	—	—	3	—	—	1	—	—	—
41	—		1	—	—	—	—	2	—	—	—	—	—	—
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	—	—	—	1	—	—	—	—	—	—
44	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	107	103	106	109	130	120	115	101	122	133	117	116	107	128
Average length cm *)	30.05	32.23	29.97	30.67	27.35	29.64	28.88	32.73	28.84	27.32	29.93	28.41	28.97	27.62

*) Not corrected by 0.5. — [1]) 49 cm: 1 spec.

ments (continued).

						A3								Area
N_9	N_8	N_9	N_9	N_9	N_8	N_8	N_8	N_9	N_9	N_9	N_9	M_9	N_8	
31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	31. V—1. VI 20	Date of capture
10 miles NW of Red Cliff	6 miles W of Red Cliff	12 miles SSW of Graa Deep Gas Buoy	8 miles W by N of Graa Deep	16 miles SSW of Graa Deep	NW of Hornum	Off Hornum	7 miles WSW of Red Cliff	12 miles SW by S of Graa Deep	15 miles SW by S of Graa Deep	10 miles NW of Red Cliff Light	10 miles SW of Graa Deep	20 miles SW of Graa Deep	NW of Red Cliff	Fishing-place
15	13	13	14	17	14	17	15	16	19	14	13	15	16	Depth in m
1500	2500	600	1000	600	800	1500	1600	1200	1500	1000	600	500	1800	Weight of catch in kg
47	28	29	28.5	29.5	31	40.5	27.5	30.5	26.5	33	25	24.5	25	Weight of sample in kg
														Length cm
—	—	—	3	1	—	—	—	—	—	—	—	—	—	23
3	7	5	2	1	—	—	—	—	3	—	—	2	—	24
2	10	32	11	3	—	—	5	3	14	—	5	7	2	25
7	29	27	19	11	2	—	18	8	32	—	25	16	5	26
6	22	30	16	13	11	4	33	20	30	9	33	22	16	27
10	13	26	13	11	16	4	19	17	18	14	18	17	19	28
8	12	15	17	10	15	8	14	13	10	17	12	16	17	29
11	10	8	5	6	19	7	15	14	11	15	6	10	11	30
8	12	5	5	15	11	10	6	13	8	13	3	5	11	31
9	1	2	5	9	17	12	6	13	2	10	6	2	6	32
10	4	—	4	5	8	13	5	4	1	4	2	3	8	33
18	1	—	8	9	7	14	1	5	—	10	3	2	2	34
7	—	—	2	5	2	13	—	1	—	6	—	2	3	35
10	2	—	3	5	—	5	1	3	—	5	—	—	—	36
9	—	1	—	—	1	5	—	1	—	—	—	—	—	37
3	—	—	1	—	—	3	—	—	—	2	—	—	—	38
6	—	—	—	1	—	2	—	—	—	—	—	—	—	39
1	—	—	—	—	—	3	—	—	—	1	—	—	—	40
—	—	—	—	—	—	—	—	—	—	—	—	—	—	41
1	—	—	—	—	—	—	—	—	—	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
—	—	—	—	—	—	—	—	—	—	—	—	—	—	45
—	—	—	—	—	—	—	—	—	—	—	—	—	—	46
129	123	151	114	105	109	103	123	115	129	106	113	104	100	Total number
32.20	27.80	27.09	28.60	30.05	30.24	32.94	28.33	29.54	27.39	30.93	27.88	28.16	29.37	Average length cm

						A3								Area
N_8	N_8	M_9	N_8	N_9	N_8	N_8	N_8	M_8	N_8	M_7	M_8	N_8	N_9	
3.—4. VI 20	5.—6. VI 20	5.—6. VI 20	5.—6. VI 20	6. VI 20	6. VI 20	6. VI 20	6. VI 20	6. VI 20	6. VI 20	6. VI 20	6.—7. VI 20	6.—7. VI 20	6.—7. VI 20	Date of capture
WSW of Red Cliff	NW of Red Cliff	14 miles WNW of Graa Deep	6 miles W by S of Red Cliff Light	3 miles SSW of Graa Deep Gas Buoy	10 miles NW of Hornum	W of Red Cliff	8 miles W of Red Cliff	44 miles SW by S of Graa Deep	8 miles WNW of Red Cliff	7 miles SW of Amrumbank Light-Ship	12 miles WNW of Hornum	7 miles WNW of Red Cliff	S by W of Graa Deep Gas Buoy	Fishing-place
15	19	18	15	13	17	15	13	19	19	19	18	16	14	Depth in m
1000	500	700	400	500	600	400	800	500	300	500	600	1400	?	Weight of catch in kg
27	27	28	26.5	27.5	31	28	23.5	34	32.5	42	32.5	26	21.5	Weight of sample in kg
														Length cm
1	—	—	1	—	—	—	—	—	—	—	—	—	—	23
—	1	2	—	1	—	4	—	—	—	—	—	4	1	24
5	6	7	6	9	—	20	3	—	—	—	2	12	7	25
15	14	7	26	31	9	28	18	2	7	—	8	26	20	26
15	23	3	38	37	28	20	26	5	13	2	17	25	30	27
12	16	5	20	26	24	16	14	7	19	10	13	13	27	28
17	9	11	12	15	23	7	16	13	13	15	22	11	11	29
8	4	9	8	9	13	7	5	8	13	6	10	9	6	30
13	5	2	3	6	7	7	5	10	18	10	10	2	2	31
3	7	12	3	—	8	4	5	10	8	12	6	5	1	32
6	4	16	3	1	5	8	2	13	4	6	6	4	—	33
1	1	9	2	—	4	2	3	10	6	2	7	3	—	34
2	5	5	—	—	2	3	—	6	3	—	3	2	—	35
3	4	3	—	—	—	—	—	3	4	12	3	—	—	36
1	1	3	—	—	2	—	1	3	1	14	1	—	—	37
—	—	3	—	—	—	1	2	5	4	2	1	—	—	38
—	—	3	—	—	—	—	—	3	—	6	1	—	—	39
—	—	—	—	—	—	—	—	1	1	6	2	—	—	40
—	—	—	—	—	—	—	—	—	—	—	—	—	—	41
—	—	—	—	—	—	1	—	1	—	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	2	—	—	43
—	—	—	—	—	—	—	—	—	—	2	—	1	—	44
102	100	100	122	135	125	128	100	100	114	105	114	117	105	Total number
29.00	28.89	31.20	27.70	27.45	29.10	28.02	28.47	32.17	30.35	33.30	30.26	27.95	27.41	Average length cm

Table of Measure-

Area	A_3													
	M_8	M_8	M_8	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	N_9	M_8
Date of capture	6.—7. VI 20	7.—8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8. VI 20	8.—9. VI 20
Fishing-place	32 miles SW by S of Graa Deep	2 miles WNW of Amrumbank Light-Ship	5 miles W of Amrumbank Light-Ship	4 miles SSW of Graa Deep	At Graa Deep Gas Buoy	2 miles SW of Graa Deep	5-6 miles S of Graa Deep	8 miles SW of Graa Deep	3 miles SW of Graa Deep	3 miles SW of Graa Deep	2 miles W of Sønderho	10 miles SW of Graa Deep	5 miles SSW of Graa Deep Bar	4 miles NW of Amrumbank Light-Ship
Depth in m	17	19	15	11	9	15	14	13	15	15	9	11	15	16
Weight of catch in kg	1000	1800	1500	1300	1000	700	900	1400	500	1000	500	1000	500	1000
Weight of sample in kg	33.5	29	31.5	26	24.5	28.5	29	26	26	26.5	26.5	26	23	29
Length cm														
23	—	—	—	—	1	—	—	—	1	—	—	—	—	—
24	1	1	—	5	2	1	—	—	1	1	—	—	7	2
25	1	2	1	12	10	—	—	12	6	6	4	14	19	15
26	7	4	1	26	33	7	7	22	26	25	22	32	21	30
27	12	12	5	34	32	14	13	34	31	34	24	36	27	28
28	7	11	13	23	17	26	22	29	19	23	28	21	11	20
29	13	16	21	9	15	13	29	8	17	20	21	15	6	12
30	13	20	15	9	5	15	14	6	7	12	11	5	7	11
31	16	11	13	5	3	8	22	3	4	2	6	3	3	6
32	12	10	6	—	—	6	6	1	2	2	—	2	4	5
33	5	7	6	—	—	4	2	4	—	1	2	—	1	1
34	11	2	3	2	—	2	4	2	1	—	1	1	1	—
35	6	3	4	—	—	4	1	—	—	—	—	—	—	1
36	1	1	2	—	—	—	1	—	—	—	—	—	1	—
37	5	—	2	—	—	3	—	—	—	—	—	—	—	1
38	1	3	2	—	—	1	—	—	—	—	—	—	1	—
39	—	—	3	—	—	1	—	—	—	—	—	—	—	—
40	—	1	2	—	—	—		—	1	—	—	—	—	—
41	—	—	1	—	—	—	—	—	1	—	—	—	—	—
42	—	—	—	—	—	1	—	—	—	—	—	—	—	—
Total number	111	104	100	125	118	106	121	121	117	126	120 [1])	129	109	133 [2])
Average length cm *)	30.68	30.09	31.04	27.30	27.09	29.71	29.40	27.60	27.76	27.66	28.10	27.27	27.27	27.77

Area	A_3													
	N_9	N_8	M_8	M_{10}	M_8	N_{10}	N_8	M_8	N_8	M_9	N_8	M_9	N_9	N_9
Date of capture	9. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	9.-10.-11. VI 20	10. VI 20	10. VI 20	10. VI 20
Fishing-place	2 miles W by S of Graa Deep	8 miles W ½ N of Red Cliff	20 miles W of Amrum	Slugen N	45 miles SW by S of Graa Deep	5 miles WNW of Bjerg-gaard	10 miles W by S of Red Cliff	14 miles W by S of Red Cliff	10 miles W by S of Red Cliff	18 miles SW of Graa Deep	10 miles W of Red Cliff	25 miles SW of Graa Deep	4 miles WNW of Graa Deep Gas Buoy	8 miles SW of Graa Deep
Depth in m	13	19	13	19	19	17	17	17	17	19	17	19	12	14
Weight of catch in kg	500	2000	7000	1500	1000	?	2000	1000	1500	800	1000	1000	400	500
Weight of sample in kg	27.5	28	40.5	24.5	29	23	29.5	26	25	25.5	30.5	34.5	22	18.5
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	1	—	—	2	—	8	1	—	1	—	—	1	—	5
25	10	2	—	6	2	15	2	5	—	—	2	2	25	21
26	13	6	1	9	12	20	10	17	7	6	23	2	20	28
27	19	20	3	25	20	20	25	30	18	6	30	5	30	20
28	9	22	11	22	13	23	15	15	30	13	27	7	19	13
29	10	23	10	16	10	16	18	17	8	15	15	11	8	9
30	8	15	11	11	9	2	9	6	13	13	13	15	6	2
31	8	7	13	9	17	5	8	12	7	10	7	7	2	3
32	4	4	14	2	5	1	10	—	8	13	6	8	2	—
33	4	2	11	3	9	1	5	4	4	15	3	8	1	—
34	6	1	11	—	2	1	2	1	1	5	—	9	—	2
35	3	1	5	1	2	—	3	1	2	11	—	10	—	—
36	3	2	7	—	1	—	2	1	1	2	—	5	—	—
37	4	2	5	—	1	—	3	—	1	2	2	1	—	—
38	—	2	4	1	2	—	1	—	—	1	—	2	—	—
39	—	—	2	—	1	—	—	1	—	4	—	1	—	—
40	—	1	5	—	2	—	—	1	1	4	1	4	—	—
41	—	1	—	—	—	—	—	—	1	—	—	—	—	—
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	2	—	—	—	—	1	—	—	1	2	—	—
Total number	103 [3])	111	116 [4])	107	108	112	114	112	103	120	131 [5])	100	113	103
Average length cm *)	29.37	29.39	32.72	28.34	29.78	27.22	29.37	28.58	29.29	31.53	28.63	31.85	27.06	26.79

* Not corrected by 0.5. — [1]) 43 cm: 1 spec. — [2]) 46 cm: 1 spec. — [3]) 45 cm: 1 spec. — [4]) 44 cm: 1 spec. — [5]) 47 cm: 1 spec. — [6]) 44 cm: 1 spec.

ments (continued).

Area	A_2													
	N_9	N_8	N_8	N_8	N_8	N_9	M_8	N_9	N_9	N_9	M_8	N_9	N_9	N_9
Date of capture	8.—9. VI 20	8.—9. VI 20	8.—9. VI 20	8.—9. VI 20	8.—9. VI 20	8.—9. VI 20	9. VI 20	9. VI 20	9. VI 20	9. VI 20	9. VI 20	9. VI 20	9. VI 20	9. VI 20
Fishing-place	5 miles NW of Knude Deep	10 miles W of Red Cliff	8 miles W by S of Red Cliff	6 miles NW by W of Hornum	3 miles W of Amrum	10 miles SW of Graa Deep	12 miles W of Red Cliff	2 miles SW of Graa Deep Buoy	4 miles SSW of Graa Deep	10 miles SW of Graa Deep	2 miles N of Amrumbank Light-Ship	10 miles NW of Red Cliff	8 miles SSW of Graa Deep	17 miles SW by S of Graa Deep
Depth in m	12	18	16	13	19	13	18	14	14	15	19	19	17	17
Weight of catch in kg	1000	800	2000	900	1500	1700	1500	1600	600	1000	1200	700	500	1500
Weight of sample in kg	23.5	33.5	29	28	34.5	27	29	26	23.5	23	27	26.5	21.5	26
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	2	2	1	—	—	—	—	—	10	—	1	—	1	—
25	14	4	4	2	—	5	6	12	13	2	6	2	11	10
26	21	12	10	8	1	18	15	33	40	12	11	18	21	33
27	33	17	20	17	9	35	29	39	29	35	17	22	35	36
28	25	20	19	25	12	28	14	23	21	34	16	22	16	16
29	14	17	18	23	21	21	17	18	10	15	15	15	19	12
30	7	11	13	14	16	7	11	2	3	10	15	11	4	8
31	2	12	12	15	9	7	7	2	3	4	7	10	2	5
32	—	5	5	5	14	4	8	3	—	1	7	4	2	1
33	—	5	1	1	12	3	7	—	—	—	5	3	—	—
34	—	1	6	1	6	—	7	—	—	—	—	3	—	1
35	—	4	3	3	3	—	1	—	—	—	3	—	—	2
36	—	—	1	—	4	—	—	—	—	—	5	—	—	—
37	—	—	—	—	1	—	—	—	—	—	1	—	—	—
38	—	—	2	—	—	—	1	—	—	—	—	1	—	1
39	—	1	—	—	2	—	—	—	—	—	2	—	—	—
40	—	—	1	—	1	—	—	—	—	—	—	1	—	—
41	—	1	—	1	1	—	—	—	—	—	—	—	—	—
42	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Total number	118	112	116	115	112	128	123	132	129	113	111	113	111	125
Average length cm	27.23	29.04	29.26	29.06	30.95	28.01	28.89	27.23	26.74	27.88	29.35	28.78	27.34	27.56

Area	A_3													
	M_9	N_8	N_9	M_9—N_8	N_9	N_9	M_9	M_9	M_9	N_9	N_9	M_8	M_9	N_8
Date of capture	10. VI 20	10. VI 20	10. VI 20	10. VI 20	11.—12. VI 20	12. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20	12.-13.-14. VI 20
Fishing-place	16 miles WNW of Vyl	9 miles W by S of Red Cliff	6 miles SW of Graa Deep	Between Graa Deep and Vyl	15 miles SSW of Graa Deep	10 miles SW of Graa Deep	11 miles W by S of Graa Deep	9 miles W by N of Graa Deep	12 miles W by S of Graa Deep	9 miles SW of Graa Deep	6 miles S by W of Graa Deep	15 miles W of Amrum	30 miles SW of Graa Deep	7 miles W of Red Cliff
Depth in m	18	18	15	17	15	14	19	17	17	16	13	15	19	17
Weight of catch in kg	500	1500	700	500	1200	800	700	1000	1000	1500	1200	500	700	600
Weight of sample in kg	32.5	24.5	26	32	25	23.5	32	32	28.5	25.5	24	26	31	29.5
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	1	1	1	1	1	1	—	3	—	—	1	—	—	—
25	—	8	6	8	7	3	—	4	1	1	27	3	1	—
26	3	19	20	30	35	15	6	12	7	14	30	23	3	5
27	14	23	30	27	36	21	6	11	18	13	27	22	8	21
28	21	16	28	20	23	23	13	13	15	16	10	19	14	23
29	17	7	13	12	10	15	15	14	16	16	7	10	17	19
30	15	10	11	13	7	7	13	15	9	14	4	10	8	9
31	6	10	3	5	2	7	10	9	8	8	2	10	12	12
32	8	7	1	5	1	2	10	8	11	7	1	4	10	13
33	6	2	2	4	3	2	15	7	8	4	—	2	11	5
34	6	1	1	4	—	1	5	6	1	5	—	6	5	2
35	5	1	1	3	—	1	10	5	3	—	—	1	3	—
36	2	3	—	1	—	1	—	1	5	1	—	2	3	1
37	2	1	—	1	—	1	2	3	—	—	—	—	1	—
38	2	—	—	1	1	1	1	3	—	1	—	1	—	1
39	—	—	1	—	—	1	5	—	—	—	—	—	2	—
40	1	—	—	—	—	—	4	2	—	—	—	—	3	—
41	1	—	—	—	—	—	—	—	—	—	—	—	1	—
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	—	—	—	—	—	—	—	—	1	1	—	—	—	—
Total number	110	109	118	135	126	102	115	116	103	101	109	113	102	112 [6])
Average length cm	30.30	28.48	27.92	28.37	27.43	28.54	31.47	30.06	29.83	29.34	26.65	28.69	30.96	29.47

Table of Measure-

Area	A_3													
	N_8	M_9	N_{10}	N_8	N_9	N_9	M_7	M_9	M_9	M_9	N_8	N_9	N_9	N_9
Date of capture	13. VI 20	13. VI 20	13. VI 20	13. VI 20	13.—14. VI 20	13.—14. VI 20	14.—15. VI 20	15. VI 20	15. VI 20	15. VI 20	15. VI 20	15. VI 20	15.—16. VI 20	15.—16. VI 20
Fishing-place	10 miles W of Red Cliff	10 miles W of Graa Deep	6 miles off Blaabjerg Bank	6 miles WNW of Red Cliff Light	10 miles WSW of Graa Deep	10 miles NW of Red Cliff Light	68 miles SSW of Graa Deep	10 miles W by S of Graa Deep	8 miles W of Graa Deep	15 miles W by N of Graa Deep	12 miles W by S of Red Cliff	8 miles WNW of Graa Deep	10 miles WSW of Graa Deep Barrel	6-7 miles W of Graa Deep
Depth in m	17	15	17	15	16	19	19	17	15	19	19	15	18	14
Weight of catch in kg	1200	200	1500	1600	500	800	1500	700	400	1000	400	400	500	500
Weight of sample in kg	26	20.5	24	27.5	31.5	34.5	28	28.5	28.5	27.5	25.5	28	37.5	26.5
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	1	2	4	—	1	—	—	—	—	1	1	2	—	—
25	2	10	30	1	2	1	—	6	1	6	25	5	1	1
26	14	17	45	15	3	5	2	10	3	18	28	32	2	2
27	22	28	31	33	5	13	15	15	15	26	22	26	6	18
28	21	15	15	22	6	10	20	21	13	15	17	20	11	28
29	17	8	4	20	15	9	23	16	20	12	12	15	10	15
30	13	5	1	9	10	10	18	11	11	10	8	12	3	16
31	7	5	—	8	20	8	8	11	12	10	5	2	11	7
32	4	5	—	6	10	8	6	12	8	7	3	2	20	8
33	3	4	—	4	9	11	1	3	1	4	2	5	8	2
34	—	1	—	2	4	13	7	3	9	5	1	2	9	9
35	1	1	—	—	5	10	1	3	4	—	1	1	7	—
36	1	—	—	—	2	5	2	—	—	—	2	1	8	—
37	1	—	—	1	4	2	1	1	2	—	2	2	2	—
38	—	—	—	—	1	—	—	—	2	—	—	—	4	—
39	—	—	—	—	2	—	—	—	2	—	—	—	5	—
40	1	—	—	—	1	2	2	—	—	1	—	—	—	—
41	—	—	—	—	—	1	—	—	—	—	—	—	3	—
42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	108	101	130	121	100	108	106	112	103	115	129	127	110	106
Average length cm *)	28.66	27.86	26.30	28.50	31.14	31.31	29.80	29.15	30.26	28.59	27.65	28.08	32.07	29.31

Area	A_3													
	M_8	M_9	N_8	M_9	N_9	M_9	N_8	N_9	M_9	N_8	M_9	N_8	N_9	M_9
Date of capture	19.—20. VI 20	19.—20. VI 20	19.—20. VI 20	20. VI 20	20.—21. VI 20	20.—21. VI 20	20.—21. VI 20	20.—21. VI 20	21.—22. VI 20	21.—22. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20
Fishing-place	45 miles SW of Graa Deep	10 miles W by S of Graa Deep	38 miles SSW ½ W of Graa Deep	8 miles W of Graa Deep	12 miles SSW of Graa Deep	22 miles SW of Graa Deep	10 miles W of Amrum Light	13 miles SW by S of Graa Deep	30 miles WSW of Graa Deep	34 miles SSW of Graa Deep	15 miles WSW of Graa Deep	35 miles SSW of Graa Deep	15 miles SW of Graa Deep	10 miles W of Graa Deep
Depth in m	19	16	17	14	14	19	15	16	18	17	15	15	14	17
Weight of catch in kg	?	900	2000	400	400	600	2500	700	1700	2000	800	1400	500	500
Weight of sample in kg	27.5	29.5	31	28	29.5	26	27	25.5	29.5	29.5	28.5	26	25.5	26.5
Length cm														
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	—	1	1	6	3	1	—	1	—	1	—	—	9	—
25	1	—	6	17	6	11	6	5	5	1	4	6	33	1
26	6	6	13	24	17	25	18	22	29	3	20	20	33	15
27	11	10	25	29	20	21	30	32	25	15	16	31	25	21
28	12	14	11	21	22	14	21	31	22	17	10	21	7	27
29	21	15	19	21	23	10	23	13	14	15	13	9	9	19
30	15	12	7	10	8	4	9	10	7	11	15	7	5	7
31	11	13	12	4	9	6	4	3	7	13	14	5	3	5
32	8	17	8	—	6	3	4	4	7	15	2	6	2	3
33	3	11	4	2	1	3	4	1	4	3	5	2	2	4
34	3	2	8	—	2	6	3	2	1	2	2	1	1	4
35	3	—	—	—	2	1	—	—	1	3	1	1	1	—
36	3	—	—	—	1	—	—	—	2	—	3	2	1	2
37	—	—	2	—	—	—	—	—	—	1	2	1	—	2
38	—	2	—	—	2	—	1	—	2	—	1	1	1	—
39	2	2	1	—	—	—	—	—	—	1	1	—	—	1
40	—	1	2	—	—	2	—	—	—	—	1	—	—	—
41	1	—	1	—	1	—	—	—	1	1	—	1	—	—
42	—	—	—	—	—	1	—	—	—	—	—	—	—	—
43	—	2	—	—	—	—	—	—	—	1	—	—	—	—
44	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Total number	100	108	120	134	123	108	124	124	127	104 [2])	110	114	132	111
Average length cm *)	30.03	30.51	29.35	27.34	28.63	28.33	28.40	27.84	28.48	29.98	29.31	28.39	26.87	28.86

*) Not corrected by 0.5. — [1]) 43 cm: 1 spec. — [2]) 43 cm: 1 spec. — [3]) 49 cm: 1 spec. — [4]) 45 cm: 1 spec.; 46 cm: 1 spec.; 47 cm: 1 spec.; 49 cm: 1 spec.

ments (continued).

A_3														Area
N_8	M_{10}	M_9	M_9	N_9	N_8	M_9	M_9	M_9	M_9	N_9	M_9	N_9	N_9	
15.—16. VI 20	16. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	17. VI 20	17. VI 20	17. VI 20	17. VI 20	18. VI 20	18.-19.-20. VI 20	19.—20. VI 20	19.—20. VI 20	19.—20. VI 20	Date of capture
10 miles WSW of Red Cliff	18 miles N of Slugen	10 miles W of Graa Deep	16 miles WSW of Graa Deep	8 miles SW by S of Graa Deep	8 miles W of Red Cliff Light	12 miles W of Graa Deep	24 miles SW of Graa Deep	10 miles W of Graa Deep	8 miles W by N of Graa Deep	18 miles SW by S of Graa Deep	12 miles W of Graa Deep	10 miles SW of Graa Deep	10 miles WSW of Graa Deep	Fishing-place
17	19	17	18	15	15	15	19	13	15	19	15	17	16	Depth in m
500	400	500	300	500	400	600	300	400	400	200	900	400	500	Weight of catch in kg
26.5	26	29.5	30	24.5	24.5	27	25	25	29.5	24.5	26	28	27.5	Weight of sample in kg
														Length cm
—	—	—	—	—	—	—	—	—	—	—	—	—	—	23
1	12	—	2	2	1	2	—	—	1	—	4	1	3	24
1	23	2	6	11	2	5	1	—	5	4	20	2	5	25
22	40	8	11	24	9	6	10	6	10	6	32	15	31	26
39	29	16	16	20	24	13	20	25	20	26	32	33	36	27
18	17	11	12	17	29	20	18	25	10	19	10	19	21	28
15	12	23	14	18	20	11	20	15	8	14	13	16	14	29
9	3	15	7	7	8	13	10	15	8	12	10	7	9	30
4	1	10	4	2	8	10	6	6	7	6	3	3	3	31
6	2	8	8	3	3	6	6	6	4	4	1	3	4	32
—	—	6	5	2	2	2	1	4	5	3	2	3	2	33
3	—	3	3	3	2	3	5	1	8	2	1	2	2	34
2	—	—	2	1	—	3	3	1	4	2	—	6	—	35
—	—	1	4	—	—	1	2	1	4	—	—	—	—	36
—	—	3	3	—	—	1	—	—	5	—	—	2	2	37
1	—	—	1	—	1	1	—	—	1	1	1	1	—	38
1	—	—	—	—	—	—	—	—	—	1	—	—	—	39
—	—	1	1	1	1	1	—	—	—	—	—	1	—	40
—	—	—	—	—	—	—	1	1	—	—	—	—	—	41
—	—	2	1	—	—	2	—	—	—	—	—	—	—	42
122	139	109	100	112 [1]	110	100	103	106	100	100	129	115 [2]	132	Total number
28.26	26.58	29.83	29.60	28.03	28.58	29.59	29.20	28.98	29.90	28.84	27.22	28.89	27.79	Average length cm

A_3												Area
M_9	M_8	N_8	N_8	M_8	M_9	M_9	N_8	N_{10}	M_8	M_{10}	N_8	
22.—23. VI 20	22.—23. VI 20	23.—24. VI 20	26.—27. VI 20	27.—28. VI 20	28. VI 20	29. VI 20	29. VI 20	29. VI 20	29. VI 20	29. VI 20	29. VI 20	Date of capture
12 miles W of Graa Deep	35 miles SW of Graa Deep	10 miles W of Red Cliff Light	12 miles W of Red Cliff	3 miles NW of Amrumbank Light-Ship	12 miles W of Graa Deep	12 miles W by N of Graa Deep	30 miles SSW of Graa Deep	5 miles W of Kjær-gaard	12 miles WNW of Hornum	8 miles W of Kjær-gaard	35 miles SSW of Graa Deep	Fishing-place
19	19	17	18	19	19	15	15	11	17	15	17	Depth in m
500	1000	800	500	1500	600	400	500	100	1200	1600	1000	Weight of catch in kg
26	30	24	26	26.5	23	23	21.5	24.5	27	25	29.5	Weight of sample in kg
												Total Length cm
—	—	—	—	—	—	—	1	—	—	—	—	13 23
—	—	15	—	—	5	18	6	—	1	—	—	231 24
12	—	32	11	2	20	40	29	1	23	2	7	1061 25
36	1	31	18	5	34	37	31	12	25	13	23	2457 26
38	13	17	37	10	30	19	29	26	32	26	35	3287 27
19	17	10	12	21	12	6	15	29	20	20	20	2638 28
9	20	8	17	31	3	10	4	19	7	18	16	2200 29
9	18	4	13	13	8	2	2	11	8	8	13	1490 30
5	15	4	4	6	4	2	2	6	6	10	4	1150 31
1	7	4	6	13	2	1	2	3	2	3	1	867 32
—	5	1	1	3	1	—	—	—	—	—	1	603 33
—	3	1	1	—	1	—	—	—	—	—	1	478 34
2	5	—	—	—	—		—	—	1	—	1	300 35
—	4	1	1	—	—	—	—	—	—	—	—	202 36
—	—	—	—	—	—	—	—	—	1	—	—	148 37
—	1	—	—	1	—	—	—	—	—	—	2	106 38
1	—	—	—	—	—	—	—	—	—	—	—	74 39
—	1	—	—	—	—	—	—	—	2	—	1	83 40
—	2	—	—	1	—	—	—	—	—	—	—	27 41
—	—	—	—	—	—	—	—	—	—	—	—	11 42
—	—	—	—	—	—	—	—	—	—	—	—	17 43
—	—	—	—	—	—	—	—	—	—	—		7 44
132	112	128	121	106	120	135	121	107	128	100	125	17454 [4] Total number
27.43	30.43	26.66	27.93	29.31	26.93	26.07	26.47	28.17	27.48	28.18	28.05	28.83 Average length cm

Table of Measure-

Area	B_4												
	M_8	M_8	N_8	M_7	M_7	M_7	M_8	M_7	M_9	M_7	K_7	N_8	
Date of capture	12.–13. V 20	16.-17.-18. V 20	18. V 20	18.—19. V 20	18.—19. V 20	19. V 20	24.-25.-26. V 20	26.—27. V 20	28.—29. V 20	28.—29. V 20	29.-30.-31. V 20	29.-30.-31. V 20	May 1920
Fishing-place	3 miles SSE of Amrumbank Light-Vessel	10 miles W of Hornum	SW of Hornum	10 miles N of Helgoland	7 miles SSW of Amrumbank Light-Vessel	7–8 miles SW of Amrumbank Light-Vessel	6 miles W by S of Amrumbank Light-Vessel	8 miles SSW of Amrumbank Light-Vessel	24 miles SW by W of Graa Deep	Between Helgoland and Amrumbank Light-Vessel	70 miles W by S of Amrumbank Light-Vessel	$5^1/_2$ miles SSW of Amrum	
Depth in m	21	21	21	23	22	24	24	23	20	21	24	23	
Weight of catch in kg	1200	2000	1400	900	500	600	2000	2000	1500	1500	1500	1500	
Weight of sample in kg	47.5	29.5	31.5	40	35.5	28.5	50	29.5	28.5	13.5	70	47	
Length cm													Total
24	—	3	—	—	—	1	—	—	—	—	—	—	4
25	—	9	5	—	1	4	—	—	—	—	2	—	21
26	—	13	15	—	1	13	—	—	10	—	—	—	52
27	2	30	15	—	3	27	—	—	12	—	—	2	91
28	7	17	17	—	1	13	—	—	12	—	—	3	70
29	5	19	15	—	—	23	—	—	17	—	—	4	83
30	6	11	18	—	2	10	—	—	17	—	—	2	66
31	8	8	16	1	6	12	1	—	8	—	2	4	66
32	7	6	8	—	3	5	—	2	14	3	—	11	59
33	5	3	9	2	5	3	—	—	8	5	4	8	52
34	7	1	2	4	5	2	3	—	4	4	—	16	48
35	6	1	2	1	9	—	2	3	1	7	6	10	48
36	7	—	1	5	9	—	7	5	2	4	4	13	57
37	13	1	1	8	10	—	12	9	—	1	4	7	66
38	5	—	—	6	10	—	8	3	—	1	8	10	51
39	2	—	—	6	5	—	10	1	—	1	18	3	46
40	7	—	—	5	4	—	10	6	—	2	14	5	53
41	8	—	1	6	2	—	10	6	—	—	4	4	41
42	3	—	—	3	—	—	4	1	—	—	6	3	20
43	2	—	—	6	—	—	9	5	—	1	6	—	29
44	—	—	—	2	—	—	2	5	—	—	8	2	19
45	—	—	—	2	—	—	—	—	—	—	2	—	4
46	—	—	—	—	—	—	1	—	—	—	2	—	3
47	—	—	—	2	—	—	—	—	—	—	—	—	2
48	—	—	—	1	—	—	—	—	—	—	2	—	3
49	—	—	—	1	—	—	—	—	—	—	8	—	9
Total number	100	122	125	61	76	113	79	46	105	29	100	107	1063
Average length cm *)	34.81	28.25	29.38	39.43	35.04	28.50	39.14	39.09	29.77	35.28	40.08	35.05	33.57

Area	B_4													
	M_7	M_7	M_7	M_7	M_7	M_8	M_8	M_7	M_7	M_7	M_7	M_7	M_7	M_7
Date of capture	8.-9.-10. VI 20	9. VI 20	9.—10. VI 20	9.—10. VI 20	9.—10. VI 20	10.-11.-12. VI 20	10.-11.-12. VI 20	11.—12. VI 20	11.—12. VI 20	11.-12.-13. VI 20	12. VI 20	12.—13. VI 20	12.—13. VI 20	12.—13. VI 20
Fishing-place	11 miles SW by S of Amrumbank Light-Vessel	8 miles N of Helgoland	5 miles N of Helgoland	10 miles N of Helgoland	8 miles N of Helgoland	58 miles SW by S of Graa Deep	10 miles WNW of Amrumbank Light-Vessel	10 miles N by W of Helgoland	60 miles SSW of Graa Deep	14—15 miles N of Helgoland	7 miles SW of Amrumbank Light-Vessel	10 miles N of Helgoland	10 miles $N\ 1^1/_2$ W of Helgoland	10—12 miles WSW of Amrumbank Light-Vessel
Depth in m	25	22	25	21	23	23	21	23	21	25	25	27	25	25
Weight of catch in kg.	1500	2000	1400	2000	2000	1500	2000	1500	1000	1400	2000	1500	1000	2000
Weight of sample in kg.	28	32	31.5	37	35	53	50	28	33.5	40	30.5	32.5	33.5	40
Length cm														
24	—	—	2	—	—	—	—	—	—	—	—	—	—	—
25	—	1	2	3	4	—	—	2	—	1	4	1	8	—
26	2	—	1	6	4	—	—	21	2	1	15	6	27	3
27	7	9	4	8	13	—	—	18	7	5	10	20	18	2
28	6	14	8	9	16	1	—	20	13	10	16	17	19	1
29	18	13	7	19	16	1	4	12	17	7	16	18	6	5
30	13	20	13	15	12	2	6	15	8	12	13	9	9	4
31	15	12	15	20	11	2	4	10	10	14	13	18	12	8
32	8	14	12	17	6	3	—	8	12	13	7	10	5	18
33	8	11	9	8	9	5	8	3	5	10	2	6	8	9
34	6	3	10	5	5	7	8	1	7	7	2	4	6	7
35	5	4	7	3	—	5	10	7	6	8	4	2	5	12
36	3	2	3	1	6	11	18	—	5	7	4	1	1	7
37	4	4	4	2	2	17	12	2	2	4	1	3	2	4
38	4	1	1	1	3	11	4	—	4	4	2	—	2	4
39	2	1	—	—	3	11	10	1	2	6	2	1	—	7
40	1	—	1	1	2	7	6	1	1	2	1	2	1	4
41	—	—	—	—	1	9	8	—	2	4	—	—	2	4
42	—	—	1	—	—	2	2	—	—	—	1	1	—	—
43		—		—	2	5	—	—	—	2	—	—	—	1
44		—		—	—	—	2	—	—	1	—	—		—
45	—	—	—	—	—	3	—	—	—	—	—	—	—	—
46	—	—	—		—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	2	—	—	—	—	—	—	
Total number	102	109	100	118	115	102	104	121	103	119 [1]	113	119	132 [2]	100
Average length cm *)	31.48	30.82	31.56	30.43	30.91	37.33	36.29	29.23	31.56	32.12	29.91	30.08	29.32	33.96

*) Not corrected by 0.5. — [1]) 53 cm: 1 spec. — [2]) 23 cm: 1 spec. — [3]) 49 cm: 2 spec. — [4]) 50 cm: 1 spec.

ments (continued).

B_4														Area
M_7	N_8	M_8	N_8	N_8	M_7	M_8	M_7	M_7	M_8	M_8	M_8	M_7	M_8	
31. V.—1. VI 20	5.—6. VI 20	5.—6. VI 20	5.-6.-7. VI 20	6. VI 20	6. VI 20	6. VI 20	6.—7. VI 20	6.—7. VI 20	6.—7. VI 20	7.—8. VI 20	7.—8. VI 20	8.—9. VI 20	8.—9. VI 20	Date of capture
8 miles N of Helgoland	WNW of Amrum	5 miles NNW of Amrumbank Light-Vessel	4 miles N of Amrum Light	4 miles NNW of Amrum	8 miles WSW of Amrumbank Light-Vessel	3 miles NNW of Amrumbank Light-Vessel	6 miles WSW of Amrumbank Light-Vessel	5 miles SSW of Amrumbank Light-Vessel	54 miles SW by S of Graa Deep	3 miles NW of Amrumbank Light-Vessel	4 miles NNW of Amrumbank Light-Vessel	6 miles SW of Amrumbank Light-Vessel	55 miles SW by S of Graa Deep	Fishing-place
22	21	23	23	20	23	23	21	21	21	21	22	21	23	Depth in m
2000	1500	1300	1600	1500	1000	1500	1400	1300	800	2000	1500	1500	1800	Weight of catch in kg
38.5	32.5	32	28	29.5	47	28	39	38.5	44	26.5	28.5	34.5	59	Weight of sample in kg
														Length cm
—	1	1	2	2	—	2	—	1	—	—	—	—	—	24
—	—	5	3	14	—	11	1	—	—	—	—	—	2	25
2	5	15	8	8	3	10	3	3	—	6	10	—	—	26
5	18	20	13	21	2	23	10	—	2	14	25	—	—	27
3	14	12	15	27	8	17	7	11	8	25	28	4	—	28
2	16	15	16	20	6	14	6	17	7	33	31	9	—	29
5	13	15	12	10	12	18	10	12	6	12	17	15	2	30
11	13	10	13	12	8	3	7	7	7	9	9	20	—	31
13	7	7	5	7	7	6	7	9	11	4	5	11	—	32
20	8	5	9	4	4	2	12	8	5	6	3	17	—	33
8	6	2	4	—	14	7	9	10	8	2	2	11	4	34
17	6	4	2	2	9	1	7	5	8	2	—	7	2	35
3	3	2	2	2	11	2	4	6	11	—	—	4	8	36
6	3	4	2	1	7	—	3	6	10	—	—	1	4	37
5	1	1	—	—	5	—	3	5	7	1	—	2	10	38
1	—	1	—		6	—	6	5	3	—	—	—	10	39
—	—	—	—	—	7	1	6	4	6	—	—	1	12	40
1	—	—	1	1	3	—	1	—	—	—	—	—	9	41
—	—	—	—	—	1	2	—	1	5	—	—	1	6	42
—	—	1	—	—	1	—	3	—	1	—	—	—	8	43
—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
—	—	—	—	—	1	—	—	—	—	—	—	—	4	45
—	—	—	—	—	—	—	—	—	—	—	—	—	—	46
—	—	—	—	—	—	—	—	—	—	—	—	—	—	47
—	—	—	—	—	—	—	1	—	—	—	—	—	—	48
—	—	—	—	—	1	—	—	—	—	—	—	—	4	49
102	114	120	107	131	116	119	106	110	105	114	130	103	85	Total number
32.97	30.25	29.56	29.71	28.68	34.02	28.96	32.94	32.47	34.18	29.23	28.72	32.17	39.33	Average length cm

B_4														Area
M_7	M_7	M_7	M_7	M_8	M_8	M_7	M_7	M_7	M_7	M_8	M_7	M_8	M_8	
13. VI 20	13. VI 20	13.—14. VI 20	13.—14. VI 20	13.—14. VI 20	13.-14.-15. VI 20	13.-14.-15 VI 20	14.—15. VI 20	14.—15. VI 20	14.—15. VI 20	14.—15. VI 20	14.—15. VI 20	15.—16. VI 20	15.—16. VI 20	Date of capture
10 miles N by W of Helgoland	8 miles SW of Amrumbank Light-Vessel	4 miles N by W of Helgoland	6 miles N by W of Helgoland	60 miles SW by S of Graa Deep	60 miles SW by S of Graa Deep	10 miles N ½ W of Helgoland	8 miles NW by W of Helgoland	12 miles SW of Amrumbank Light-Vessel	12 miles NNW of Helgoland	65 miles SW ½ W of Graa Deep	10 miles N of Helgoland	60 miles SW by S of Graa Deep	6 miles W by S of Amrumbank Light-Vessel	Fishing-place
25	25	25	25	27	28	25	26	23	23	25	23	26	26	Depth in m
?	1500	2000	2500	1000	1500	2000	1500	2500	1600	2000	2000	2000	2000	Weight of catch in kg
46	33.5	40	31	36.5	25	39.5	46.5	54	42	62.5	32	54.5	44.5	Weight of sample in kg
														Length cm
—	—	—	—	—	—	—	—	—	—	—	—	—	—	24
1	—	—	—	1	—	—	—	—	3	—	2	—	—	25
1	4	1	3	1	—	2	—	—	1	—	5	—	2	26
3	20	3	10	2	—	5	1	3	—	—	10	1	2	27
7	23	10	20	7	1	12	1	1	3	—	13	1	6	28
6	13	5	16	12	1	7	3	3	5	3	16	5	10	29
14	16	10	7	11	2	6	12	4	3	1	11	5	10	30
11	11	8	10	10	2	7	9	10	11	5	5	10	18	31
15	7	10	11	5	2	6	4	8	8	3	7	14	14	32
10	4	10	4	9	4	8	7	12	7	6	8	12	16	33
8	5	9	2	11	3	9	7	6	10	12	6	11	7	34
12	—	12	2	6	5	9	5	14	12	11	4	6	6	35
8	1	10	3	4	5	8	5	8	7	9	3	7	5	36
7	2	3	4	6	2	6	4	—	7	12	1	14	4	37
5	1	3	6	3	4	4	4	8	4	12	2	9	4	38
2		3	—	5	1	4	8	6	6	10	2	6	1	39
3	1	6	1	2	4	3	7	10	2	12	4	6	3	40
4	—	5	1	1	2	—	7	1	3	4	—	—	2	41
—	1	—	—	3	3	2	8	8	7	6	—	5	—	42
2	—	—	—	1	1	1	5	2	—	1	1	1	1	43
—	—	—	—	1	1	—	—	4	1	1	—	1	1	44
—	—	—	—		1	1	3	2	—	1	—	3	1	45
—	—	—	—	—	1	1	—	—	—	4	—	1	—	46
—	—	—	—	—	1	—	—	—	—	1	—	1	2	47
119	109	108	100	101	46	101	100	112 [3])	100	115 [4])	100	119	118	Total number
33.19	29.74	33.36	30.79	33.06	36.74	33.23	35.98	35.94	34.46	37.23	30.97	35.29	33.24	Average length cm

Area	B_4												
	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_8	M_7	M_7	M_7
Date of capture	15.—16. VI 20	15.—16. VI 20	15.—16. VI 20	15.—16. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20	16.—17. VI 20
Fishing-place	10 miles NW of Helgoland	15 miles NW by W of Helgoland	10 miles N of Helgoland	8 miles NNE of Helgoland	16 miles NW by W of Helgoland	12 miles NW of Helgoland	15 miles NW of Helgoland	65 miles SW by S of Graa Deep	73 miles SW ½ S of Graa Deep	3 miles N of Amrumbank Light-Vessel	70 miles SW by S of Graa Deep	15 miles NW of Helgoland	70 miles SW ½ S of Graa Deep
Depth in m	28	26	26	25	26	30	27	28	28	21	32	23	26
Weight of catch in kg	900	1000	1500	1000	1000	3000	2000	2000	8000	1900	2000	2500	1000
Weight of sample in kg	62.5	63	31.5	44	61	60.5	27	50	52	23.5	35.5	50	26.5
Length cm													
24	—	—	—	—	—		—	—	—	1	—	—	—
25	—	—	—	1	—	—	4	—	—	7	—	—	—
26	—	—	8	—	—	—	7	—	2	18	2	—	—
27	—	—	18	4	—	—	21	—	2	16	4	—	—
28	—	4	13	5	2	—	10	—	2	18	13	1	—
29	—	5	15	5	2	—	14	—	2	11	15	—	2
30	3	5	16	12	1	—	12	1	8	8	9	3	3
31	3	2	12	11	14	3	14	—	6	8	9	5	3
32	5	7	8	8	7	—	7	4	—	5	16	9	7
33	7	11	3	7	2	2	5	6	4	3	10	10	4
34	12	6	2	10	12	4	6	10	8	2	4	10	9
35	7	8	7	13	6	6	—	3	4	1	7	13	2
36	11	8	6	12	15	6	2	6	6	1	5	9	3
37	4	9	—	1	7	6	—	7	8	—	1	11	5
38	13	5	2	3	8	10	—	2	6	—	1	7	8
39	3	2	1	4	7	6	—	6	10	2	—	8	7
40	9	9	—	4	4	10	1	8	10	—	—	6	2
41	4	9	—	1	6	—	—	8	4	—	1	5	2
42	3	5	—	3	7	2	—	3	5	—	1	1	2
43	5	2	2	—	5	2	—	3	3	—	—	3	1
44	5	3		—	—	4	—	6	—	—	4	2	—
45	2	2	—	—	2	2	—	—	4	—	—	1	1
46	5	1	—	—	—	—	—	3	—	—	—	—	2
47	2	1	—	—	1	2	1	1	—	—	—	—	2
48	—	2	—	—	2	4	—	—	—	—	—	1	—
49	1	—	—	—	2	4	—	—	2	—	1	—	—
50	1	—	—	—		5		2	—	—	—	—	—
51	—	3	—	—	—	—	—	1	1	—	—	1	—
Total number	105	109	113	104	112	80 [1])	104	80	97	101	103	106	65
Average length cm *)	38.00	36.86	30.35	33.34	36.68	40.66	29.63	38.61	36.62	28.57	31.98	36.25	36.35

Area	B_4												
	M_8	M_7	N_8	M_8	M_7	M_7	M_8	M_8	M_7	M_9	M_7	M_8	M_{10}
Date of capture	19.-20.-21. VI 20	20.—21. VI 20	20.—21. VI 20	20.—21. VI 20	20.-21.-22. VI 20	21.—22. VI 20	21.—22. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20	22.—23. VI 20
Fishing-place	37 miles SW by S of Graa Deep	14 miles SW of Amrumbank Light-Vessel	8 miles WNW of Amrum	50 miles SSW of Graa Deep	65 miles SSW of Graa Deep	15 miles NNW of Helgoland	50 miles SW by S of Graa Deep	55 miles SW by S of Graa Deep	12 miles SW by S of Amrumbank Light-Vessel	14 miles WSW of Graa Deep	7 miles S of Amrumbank Light-Vessel	34 miles SW of Graa Deep	Slugen N
Depth in m	20	26	26	23	26	28	23	25	25	20	23	20	23
Weight of catch in kg	1500	1000	500	300	1000	900	2000	300	2000	1500	800	800	400
Weight of sample in kg	36	51	34	33	33.5	50	50	32.5	43	26.5	34	26	26.5
Length cm													
24	—	—	1	—	—	—	—	—	1	2	—	1	1
25	5	—	—	1	—	—	—	1	2	17	—	2	4
26	8	—	1	3	—	—	—	2	—	25	—	17	20
27	17	2	8	8	7	1	—	6	3	31	8	18	33
28	17	3	10	8	13	1	—	3	7	22	5	15	24
29	10	4	3	12	10	2	—	9	13	14	12	11	18
30	8	3	10	10	8	3	—	7	10	12	14	12	12
31	12	12	5	5	10	5	6	10	7	1	20	11	—
32	9	14	12	10	11	5	2	8	10	3	13	6	3
33	5	15	8	2	10	3	16	5	9	2	8	3	1
34	4	17	7	7	12	10	8	7	8	—	4	1	1
35	4	11	10	7	3	2	6	5	11	1	5	1	—
36	5	6	2	4	3	3	2	2	2	1	4	1	—
37	1	6	8	3	3	2	6	6	6	1	—	1	—
38	3	6	5	5	2	5	12	3	6	—	2	1	—
39	1	4	3	5	1	5	4	2	5	—	1	1	—
40	3	6	1	—	2	4	8	2	3	—	3	2	—
41	4	2	1	1	1	6	10	2	—	—	2	—	—
42	1	5	—	—	1	6	—	1	1	—	—	—	—
43	1	1	—	—	1	—	4	2	1	—	—	—	—
44	—	—	—	2	1	7	—	—	1	—	—	—	—
45	—	1	—	1	—	3	2	—	—	—	—	—	—
46	—	1	—	—	—	1	—	—	—	—	—	—	—
47	—	—	—	—	1	—	—	—	—	—	—	—	—
48	—	—	—	—	—	2	—	—	—	—	—	—	—
49	—		—		—	—	2	1	—	—	—	—	—
50	—		—			—	—		—	—	—	—	—
51	—	—	—	—	—	—	—	—	—	—	—	—	—
Total number	118	119	95	94	100	80 [4])	88	85 [5])	106	132	102 [6])	104	117
Average length cm *)	30.83	34.54	32.42	32.49	32 19	38.11	37.00	33.00	32.88	27.60	31.88	29.15	27.79

*) Not corrected by 0.5. — [1]) 64 cm: 2 spec. — [2]) 64 cm: 2 spec. — [3]) 54 cm: 6 spec. — [4]) 52 cm: 3 spec.: 56 cm: 1 spec. [5]) 52 cm: 1 spec. — 3 spec.; 64 cm: 4 spec.

ments (continued).

B4													Area
M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	M_7	
16.—17. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.—18. VI 20	17.-18.-19. VI 20	18.—19. VI 20	18.-19.-20. VI 20	19.—20. VI 20	Date of capture
20 miles NW of Helgoland	15 miles NW of Helgoland	15 miles NW of Helgoland	13 miles NW of Helgoland	15 miles NW by N of Helgoland	15 miles NW by N of Helgoland	15 miles NW of Helgoland	16 miles NW of Helgoland	71 miles SW by S of Graa Deep	10 miles N by W of Helgoland	62 miles SW by S of Graa Deep	70 miles SW by S of Graa Deep	10 miles NW of Helgoland	Fishing-place
28	23	25	26	28	28	30	32	31	23	28	36	28	Depth in m
1400	1500	1500	1000	1500	1000	900	1500	2000	1500	1000	250	950	Weight of catch in kg
50	50	54	42	30	60	51	68	50	32.5	59	50	58	Weight of sample in kg
													Length cm
—	—	—	—	—	—	—	—	—	—	1	—	—	24
—	—	2	—	—	—	1	—	—	—	—	—	—	25
—	1	—	—	—	—	—	—	—	—	—	—	—	26
—	2	4	5	—	4	2	4	1	1	—	—	—	27
—	2	1	5	2	3	6	—	1	2	—	—	—	28
—	5	3	6	3	5	5	6	3	5	1	—	—	29
—	5	8	5	1	7	3	6	—	6	1	2	2	30
2	7	12	11	6	6	5	14	5	9	2	—	—	31
2	8	4	10	5	5	7	6	5	6	1	4	2	32
4	16	10	10	12	8	8	8	3	14	3	4	2	33
12	9	10	11	7	5	12	10	7	4	3	2	2	34
12	17	10	5	13	7	8	12	14	5	1	8	—	35
6	11	6	10	4	8	4	6	12	3	3	4	10	36
4	3	4	6	3	6	8	8	8	3	3	12	10	37
4	5	4	5	3	10	5	4	10	2	9	4	10	38
4	6	8	2	2	13	10	10	7	3	5	10	2	39
4	7	2	4	2	8	6	2	9	4	7	14	6	40
2	3	4	3	4	4	3	2	6	1	4	10	2	41
4	4	8	1	—	12	2	6	—	2	5	—	2	42
2	1	2	—	1	1	2	2	2	2	3	4	2	43
—	2	6	—	—	3	1	2	2	1	4	—	2	44
4	1	4	1	—	1	3	4	3	1	3	2	—	45
2	1	—	—	—	1	1	—	1	2	5	2	4	46
—	—	—	1	1	—	2	—	—	—	2	—	2	47
4	—	—	2	—	1	1	2	—	—	2	—	—	48
—	—	—	—	—	3	1	2	—	1	2	—	—	49
—	—	—	—	—	—	1	4	—	—	2	—	6	50
4	—	—	—	—	—	—	2	—	—	2	2	2	51
76	116	112	103	69	121	107	122	99	77	76 [2])	84	74 [3])	Total number
38.45	34.97	35.46	34.00	34.62	36.51	35.81	36.31	36.63	34.61	40.93	38.38	40.95	Average length cm

B4											B5	Area
M_7	M_7	M_8	N_8	M_8	M_8	M_7	M_7	M_9	M_9		N_{11}	
22.-23.-24. VI 20	23.—24. VI 20	23.—24. VI 20	23.—24. VI 20	23.—24. VI 20	23.—24. VI 20	24.—25. VI 20	26.—27. VI 20	29. VI 20	29. VI 20	June 1920	13.—14. VI 20	Date of capture
9 miles N by W of Helgoland	10 miles N by W of Helgoland	10 miles WNW of Amrumbank Light-Vessel	W by S of Red Cliff	50 miles SW by S of Graa Deep	35 miles SW by S of Graa Deep	10 miles NNW of Helgoland	15 miles NW of Helgoland	15 miles W by N of Graa Deep	25 miles SW of Graa Deep		6 miles W of Lyngvig	Fishing-place
21	26	26	23	26	20	25	28	21	23		27	Depth in m
500	1500	900	1400	500	700	1000	1500	700	1000		200	Weight of catch in kg
34	32	50	26	35.5	27.5	32	56	26.5	26		27.5	Weight of sample in kg
										Total		Length cm
—	—	—	—	—	—	1	—	3	4	28	2	24
—	—	—	3	2	—	3	—	12	11	147	5	25
15	6	—	8	6	11	5	2	23	20	395	12	26
15	10	1	23	6	24	8	—	35	31	722	13	27
13	9	2	15	6	26	12	3	21	18	774	9	28
10	10	1	14	6	20	12	5	15	11	796	11	29
9	7	2	13	4	10	9	5	12	5	736	10	30
12	12	5	5	3	7	11	3	4	6	760	11	31
10	9	4	7	8	2	11	5	1	3	657	6	32
3	5	10	4	1	4	7	8	3	3	629	5	33
7	8	6	2	3	1	6	9	1	2	592	7	34
1	3	3	1	1	—	4	2	1	1	525	5	35
5	8	2	1	6	—	2	10	—	1	454	1	36
2	2	5	2	3	—	6	8	—	—	390	3	37
4	2	8	2	2	2	3	10	—	—	375	—	38
2	2	8	—	5	2	2	3	—	1	323	—	39
2	3	6	—	6	—	1	6	—	3	332	—	40
2	—	9	—	4	—	—	2	—	—	206	—	41
1	2	4	—	4	2	1	7	—	—	182	—	42
1	—	2	—	1	—	—	2			108	—	43
—	—	2	—	1	—	—	2	—	—	75	—	44
1	1	1	—	1	—	1	3	—	—	76	—	45
—	1	1	—	—	—	—	2	—	—	43	—	46
—	1	—	—	1	—	—	2	—	—	30	—	47
—	—	—	—	—	—	—	1	—	—	25	—	48
—	—	—	—	—	—	—	1	—	—	30	—	49
—	—	—	—	—	—	—	1	—	—	23	—	50
—	—	—	—	—	—	—	—	—	—	18	—	51
115	101	85 [7])	100	80	111	105	102	132 [8])	120	9473 [9])	100	Total number
30.95	32.06	37.28	29.20	33.73	29.07	31.24	36.62	27.61	28.17	32.98	29.65	Average length cm

[2]) 56 cm: 1 spec. — [7]) 52 cm: 2 spec.; 56 cm: 1 spec. — [8]) 23 cm: 1 spec. — [9]) 23 cm: 2 spec.; 52 cm: 6 spec.; 53 cm: 1 spec.; 54 cm: 6 spec.; 56 cm:

DANSK RESUMÉ.

KIRSTINE SMITH:

DANSKE UNDERSØGELSER AF RØDSPÆTTER FRA NORDSØEN.

JULI 1919 — JULI 1920.

I. Indledning.

Det blev allerede ved Maalinger foretaget i Foraaret 1919 godtgjort[1]), at det procentiske Antal af større Rødspætter i den sydøstlige Nordsø var tiltaget stærkt siden de i Perioden 1904—1906 foretagne Maalinger og siden 1916. For yderligere at underbygge disse Resultater og skabe et godt Grundlag til Sammenligning med fremtidige Maalinger, blev Længdemaalingerne af Rødspætter i Esbjerg fortsatte til hen i September 1919 og igen med Støtte af Fiskerikontrollen optaget i Maj og Juni 1920. Det er især disse Maalinger, som der her er gjort Rede for.

Udbyttet af Rødspættefiskeriet i Nordsøen var i 1919 omtrent det samme som det aarlige Udbytte i Aarene forud for Krigen. Det er særlig det engelske Fiskeri, der er drevet stærkt, og dette gælder i endnu højere Grad i 1920 end i 1919. Udbyttet af det tyske Rødspættefiskeri er for 1919 større end nogensinde før, medens den hollandske Fangst er noget større end i Aarene forud for Krigen. Naar Udbyttet af det danske Rødspættefiskeri i 1919 dog kun var halvt saa stort som det aarlige Udbytte i 1912, 1913 eller 1915 og Udbyttet i 1920 endnu mindre end i 1919, maa det derfor bero paa Forhold, som ikke har noget med Rødspættebestandens Rigelighed at gøre. Statistiken viser da ogsaa, at der siden 1916 har fundet en delvis Omlægning Sted af det danske Fiskeri i Nordsøen fra Rødspættefiskeri til Kullerfiskeri, saa at det sidste for 1919 saa vel i Pengeværdi som i Fangstmængde har Overvægten over Rødspættefiskeriet.

II. Maalinger af Rødspætter ilandbragte i Esbjerg.

De i 1919 udførte Maalinger af Rødspætter fra Farvandene Vest for Esbjerg er det største aarlige Maalemateriale, som hidtil har foreligget fra dette Omraade. Det omfatter over 107.000 Rødspætter fordelt i 931 Prøver, af hvilke 76 % stammer fra Feltet A_3 (se Fig. 1). I Maj og Juni 1920 er der maalt over 58.000 Rødspætter bestaaende af 521 Prøver, af hvilke de 81 % er fra Feltet A_3. De talrigste Maalinger fra tidligere Aar (1905 og 1916) omfatter kun omtrent 12.000 Fisk. Det omfattende Materiale fra 1919 gør det for første Gang muligt at faa nøjere Oplysninger om Størrelsesfordelingen af Rødspætter og dens Forandring med Aarstiden og Fangststedets Beliggenhed.

De fleste af Prøverne er i 1919 og 1920 taget fra de Omraader af Felterne A_3 og B_4, som ligger mellem 54° 30′ og 55° 30′ N. Br. Den nordlige Del af dette Bælte, som begrænses af 55° 00′ kaldes A_3B_4n og den sydlige Del A_3B_4s. Hvert af de to Bælter er inddelt efter Dybden med Interval 2 m.

For disse smaa Arealer er der for hver Dekade (10 Dage) beregnet Antallet af Rødspætter over 33 cm pr. 100 Rødspætter over 27 cm. Det ses af Tabellerne 3 og 4, at overalt, hvor Prøverne er nogenlunde tal-

[1]) Se JOHANSEN og SMITH: Investigations as to the effect ..., p. 12 (Medd. fra Komm. for Havunders. Serie: Fiskeri, Bind V, Nr. 9. 1919).

rige, tiltager dette Procenttal stærkt med Dybden, det gælder især i Maj, medens Procenttallet i Juni og senere paa Sommeren vokser langsommere med Dybden. Naar man ser paa Værdierne for en given Dybde, finder man, at Procenttallene for Rødspætter over 33 cm antager Maksimumsværdier i den tredie Dekade af Maj 1920 baade i A_3B_4n og i A_3B_4s, men Maksimumsværdien er en Del større i det nordlige end i det sydlige Omraade. I 1919 finder man en tilsvarende Maksimumsværdi for A_3B_4n i den mellemste Dekade af Maj, medens der fra A_3B_4s er for faa Prøver fra Maj til at give Oplysning om en saadan Variation.

Af Tab. 5 og 6, som indeholder de tilsvarende Procenttal beregnet for Maaneder, fremgaar det, at de aftager gennem Juni og Juli til August, hvorimod Værdien for September igen viser en Stigning i Antallet af større Rødspætter, som gennemgaaende er større i A_3B_4s end i A_3B_4n.

De her omtalte Undersøgelser bruges til at afgøre om en forefunden Forskel mellem to Grupper af Prøver taget paa forskellige Tidspunkter fra større Omraader, som $A_{3,b}$ (d. v. s. den Del af A_3, som er mere end 8 m dyb) og B_4, maa antages at hidrøre fra Fiskepladsernes forskellige Beliggenhed eller fra en i Tidens Løb foregaaet Forandring i Bestanden.

Ved Sammenligning af Hyppighedsfordelingen af de forskellige Længder beregnet pr. 1000 Rødspætter over 27 cm (Tabel 10) for samme Maaned af forskellige Aar ser man, at der ikke for Maj og Juni kan paavises nogen Forskel i Bestanden i $A_{3,b}$ fra 1919 til 1920. For September finder man en lignende Tilvækst af den relative Hyppighed af større Rødspætter fra de tidligere Maaleperioder, 1904—1905 og 1916, til 1919, som allerede er paavist for Foraarsmaanederne. Denne Tilvækst viser sig tydeligt i den relative Hyppighed af Rødspætter over 33 cm, som for alle Maalinger fra A_3 i 1919 er 156 per 1000 Rødspætter over 27 cm. For Aarene 1904, 1905 og 1906 er denne Hyppighed kun henholdsvis 33, 37 og 42, og for 1916 er den 78.

Det forekommer paa Forhaand sandsynligt, at den efter Aarstiden forefundne Variation i den relative Hyppighed af større Rødspætter i Omraadet $A_{3,b}$ skyldes Vandringsfænomener. Imidlertid kan man ikke ved et løst Skøn faa noget Indtryk af, hvorledes den i Løbet af Aaret ret varierende Vækst-hastighed virker paa Bestandens Størrelsesfordeling. Det er derfor med Udgangspunkt fra en maanedlig Værdi for den relative Hyppighed af Rødspætter over 33 cm beregnet, hvilken Værdi denne Hyppighed vilde faa efter en given Vækstperiode, naar der ingen Ind- eller Udvandring fandt Sted mellem $A_{3,b}$ og de omgivende Omraader. I Beregningen er det forudsat, at Rødspætter fra 26 til 32 cm gennemsnitlig vokser lige hurtig, og den betragtede Vækstperiode er den Tid, som det tager for en Rødspætte af denne Størrelse at vokse 1 cm. Det er endvidere forudsat, at Rødspætter af Længder over 27 cm gennemsnitlig er lige udsat for Fangst saavel som for Død af andre Aarsager. Desuden har man for Rødspætter paa 26 cm maattet gøre særlige Forudsætninger om Sortering og Fangstprocent, men der er her regnet med en højere og en lavere Grænse, som er valgt ret vide, og den Usikkerhed, der behæfter disse Forudsætninger, kan saaledes følges i Regneresultaterne.

Resultaterne (Tabel 12) viser, at med Udgangspunkt fra den for April, Maj og Juni forefundne Bestand maa man efter en Vækstperiode vente at finde en forøget Procent af Rødspætter over 33 cm, men saa svagt forøget, at den stærke Stigning i Procenten fra April til Maj er omtrent 5 Gange saa stor som den, man allerhøjst kunde vente. Man maa derfor antage, at der i Maj er sket en Indvandring af større Rødspætter, og da der er et stærkt Fald i den forefundne Procent af Rødspætter over 33 cm fra Maj til Juni, maa de større Fisk allerede i Juni igen søge bort, eller der maa fra grundere Vand være tilkommet mindre Fisk. For Vækstperioden, begyndende midt i Juni behøver man ikke paa Grund af Størrelsesfordelingen at antage, at der har fundet Vandringer Sted, kun den forøgede Gennemsnitsdybde for Fangstpladserne tyder derpaa. Derimod tyder Procenttallene for August og September paa, at der endnu i Juli—August har været en Bevægelse fra mindre til større Dybder og i Aug.-Sept. en Vandring indefter. Disse Resultater stemmer godt med, hvad der er oplyst ved Mærkningsforsøgene om Rødspætternes Vandringer i Foraaret og Sommeren. Der foreligger ogsaa et enkelt Mærkningsforsøg fra 11te September 1912, som ved Udsættelse af Rødspætter i Nærheden af Vyl Fyrskib viser en mod Kysten rettet Bevægelse.

Maalinger fra B_4 er i Aarene forud for 1919 kun sparsomme. Der foreligger nogle faa Prøver fra 1905 og 1916, som for Juni og Juli Maaned viser en fortsat Stigning af Antallet af Rødspætter over 33 cm beregnet pr. 1000 Rødspætter over 27 cm. I det hele taget bekræfter Prøverne fra B_4 de fra A_3 indvundne Resultater.

Fra Feltet C_2 foreligger der af ældre Maalinger kun 23 Prøver fra Juli—September 1916. Da der ikke i dette Omraade kan paavises nogen Variation af Størrelsen i Løbet af disse Maaneder, kan de slaas sammen til Sammenligning med de foreliggende Prøver fra Juli og September 1919. Det viser sig (se Tabel 15), at den gennemsnitlige Længde i 1919 er mere end 6 cm (Middelfejl 1 cm) større end i 1916, og at Procenttallet af Rødspætter over 40 cm pr. 100 Rødspætter over 33 cm i det samme Tidsrum er steget til det dobbelte.

II. Aldersbestemmelser af Rødspætter fra A_3 i 1920.

Der foreligger Aldersbestemmelser ved Otolithundersøgelse af to Prøver taget i April 1920. Det fremgaar ved Sammenligning med tidligere Aldersanalyser fra samme Omraade, at Prøverne fra 1915, 1919 og 1920, ligegyldig om de er taget i Horns Rev Omraadet eller fra en sydligere Del af A_3 (W. for Sild), indeholder forholdsvis flere Fisk af V^{te} og ældre Aldersgrupper. En Sammenligning af den gennemsnitlige Længde af de Individer af en Aldersklasse, som er over 27 cm, foretagen for Prøver indsamlede i Marts til Maj kunde tyde paa, at Væksten var hurtigere i Horns Rev Omraadet end vest for Sild, men Materialet er for spinkelt til at afgive et fyldestgørende Bevis.

Af Tabel 19 ses det, at den gennemsnitlige Alder for Rødspætter af en given Længde stemmer nøje overens for de to Prøver fra 1920. Figur 2 giver en Sammenligning med Resultaterne fra tidligere Aldersanalyser fra A_3. Der ses en tydelig Forskel mellem Gennemsnitsalderen for Prøverne 1904—1907 og de øvrige Prøvers. Disse Prøver fra 1915, 1919 og 1920 viser tilnærmelsesvis samme Gennemsnitsalder, muligvis dog en reel Nedgang i Alderen fra 1915 til 1920.

III. Slutningsbemærkninger.

Ved de her offentliggjorte nye Maalinger fra 1919 og 1920 er de ved Hjælp af Maalinger fra Foraaret 1919 vundne Resultater for Omraaderne $A_{3,b}$ og B_4 yderligere blevet underbyggede. Det er desuden blevet paavist, at man ogsaa for Feltet C_2 finder en Stigning af den relative Hyppighed af store Rødspætter. Efter det Resultat, som Aldersanalyserne viser, maa det anses for godtgjort, at Gennemsnitsalderen af Markedsrødspætterne i et givet Omraade er steget som Følge af en under Krigen formindsket Dødelighed, og at den højere Gennemsnitsalder giver sig Udslag i en forøget relativ Hyppighed af større Fisk.

Allerede i 1919 har det samlede Fangstudbytte fra Nordsøen naaet den Størrelse, det havde før Krigen, og at dømme efter de hidtil foreliggende statistiske Oplysninger er det for 1920 endnu meget større. Hvis derfor den anførte Forklaring er rigtig, maa et saa stærkt Fiskeri i Løbet af faa Aar udøve en kendelig Indflydelse saa vel paa Markedsrødspættens Gennemsnitsalder som paa dens Længde.

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